



Disponible en ligne sur

ScienceDirect  
www.sciencedirect.com

Elsevier Masson France

EM|consulte  
www.em-consulte.com



Original article

## Endoscopic 3rd ventriculocisternostomy: Procedural complications and long-term dysfunctions?



### Ventriculocisternostomie endoscopique du troisième ventricule : complications procédurales et dysfonction à long terme ?

A. Melot<sup>a</sup>, S. Curey-Lévêque<sup>a,\*</sup>, S. Derrey<sup>a</sup>, E. Gérardin<sup>b</sup>, A. Borden<sup>c</sup>, P. Fréger<sup>a</sup>, F. Proust<sup>a</sup>

<sup>a</sup> Department of neurosurgery, Rouen university hospital, Charles-Nicolle, 1, rue de Gérmont, 76031 Rouen cedex, France

<sup>b</sup> Department of neuroradiology, Rouen university hospital, Charles-Nicolle, 1, rue de Gérmont, 76031 Rouen cedex, France

<sup>c</sup> Department of neurology, Rouen university hospital, Charles-Nicolle, 1, rue de Gérmont, 76031 Rouen cedex, France

#### ARTICLE INFO

##### Article history:

Received 28 August 2012

Accepted 24 July 2013

##### Keywords:

Endoscopic third ventriculocisternostomy

Non-communicating hydrocephalus

Long-term outcome

Complications

#### ABSTRACT

**Background and purpose.** – The endoscopic third ventriculostomy (ETV) has become the treatment of choice for managing non-communicating hydrocephalus. The aim of this study was to evaluate the efficacy and the morbi-mortality of this procedure and its long-term outcome.

**Patients and methods.** – This retrospective study involved 82 consecutive patients treated for non-communicating hydrocephalus by ETV, in a single centre, between June 1999 and November 2008. The main criterion of efficacy was clinical improvement with shunt independence. The secondary criteria were the ventricular size (third and lateral ventricles) outcome and the procedural morbidity and mortality. In order to determine the predictive factors of dysfunction, a uni- and multivariate analysis was conducted.

**Results.** – Divided in two groups, the overall success rate was 65.4% in the paediatric group ( $n=26$ ) and 83.9% in the adult group ( $n=56$ ), after respectively a mean follow-up of  $59.1 \pm 36.7$  and  $49.3 \pm 27.7$  months. A procedural complication occurred in 5 patients (6.1%), with no procedure-related death. The predictive factors of ETV failure were an infectious aetiology and an age less than 16. Changes in ventricular size and success rate were independent.

**Conclusions.** – ETV is an effective procedure at long-term for the management of non-communicating hydrocephalus with low morbidity. Therefore, it should be considered as first-line treatment. Cerebrospinal meningitis infection and young age both expose patients to possible dysfunction.

© 2013 Elsevier Masson SAS. All rights reserved.

#### R É S U M É

##### Mots clés :

Ventriculocisternostomie endoscopique du

troisième ventricule

Hydrocéphalie non communicante

Suivi à long terme

Complications

**Objectifs.** – La ventriculocisternostomie endoscopique du plancher troisième ventricule est devenu le traitement de choix des hydrocéphalies non communicantes. Le but de cette étude était d'évaluer l'efficacité de cette procédure, la morbi-mortalité qui lui était associée et son suivi à long terme.

**Patients et méthodes.** – Cette étude rétrospective comprenait 82 patients consécutifs traités pour une hydrocéphalie non communicante par ventriculocisternostomie endoscopique, dans un centre unique, entre juin 1999 et novembre 2008. Le principal critère d'efficacité était l'amélioration clinique sans nécessité d'implantation d'une dérivation interne de LCS. Les critères secondaires étaient la taille des ventricules (ventricules latéraux et troisième ventricule), l'évolution à long terme et la morbi-mortalité procédurale. De plus, afin de déterminer des facteurs prédictifs de dysfonction, une analyse uni- et multivariée a été menée.

**Résultats.** – La population a été scindée en deux groupes : adultes et enfants. Le taux de succès dans le groupe pédiatrique ( $n=26$ ) était 65,4% et dans le groupe adulte ( $n=56$ ) 83,9% après un suivi moyen de respectivement de  $59,1 \pm 36,7$  et  $49,3 \pm 27,7$  mois. Une complication procédurale est survenue chez cinq patients (6,1 %), sans mortalité rapportée au geste chirurgical. Les facteurs prédictifs d'échec étaient une

\* Corresponding author.

E-mail address: [sophie.leveque10@orange.fr](mailto:sophie.leveque10@orange.fr) (S. Curey-Lévêque).

étiologie infectieuse à l'hydrocéphalie et l'âge du patient inférieur à 16 ans. La modification de taille des ventricules et le succès de la procédure étaient indépendants.

**Conclusion.** – La ventriculocisternostomie endoscopique du plancher du troisième ventricule est une procédure efficace à long terme pour la prise en charge des hydrocéphalies non communicantes. Avec une faible morbidité, cette procédure devrait être employée en première intention tout en considérant que l'étiologie infectieuse et l'âge inférieur à 16 ans sont deux situations qui exposent à un échec.

© 2013 Elsevier Masson SAS. Tous droits réservés.

## 1. Introduction

Since the 1990s [1,2], the endoscopic third ventriculostomy (ETV) has been the first-line procedure proposed for non-communicating hydrocephalus. ETV is considered superior to the internal ventricular shunt (IVS) mainly because it does not expose the patient to many of the complications observed after the implantation of a shunt system [3].

However, this procedure is not devoid of procedural complications affecting 7–12% of patients [4–6]. ETV dysfunctions occur in approximately 14–37% of patients [7,8], resulting sometimes in serious complications [9].

In non-communicating hydrocephalus, ETV efficacy has been obtained in 80% of patients, but this figure reflects patient follow-up times that were limited to 2 to 3 years following the procedure [10–14]. An analysis of long-term efficacy is necessary as very few long-term studies have been published. The aim of our study was to assess the long-term efficacy (over 4 years on average) and reasons for failure, in a retrospective series of 82 consecutive patients treated by ETV.

## 2. Clinical material and methods

### 2.1. Study design

This single centre retrospective study involved all consecutive patients treated for hydrocephalus by an ETV between June 1999 and June 2008. The primary objective was to evaluate the long-term clinical efficacy of ETV. Secondary objectives were:

- to evaluate the morbidity and mortality of the procedure;
- to quantify the reduction in the size of the ventricular system and to correlate this reduction with evolution;
- to determine the predictive factors of efficacy.

### 2.2. Inclusion and exclusion criteria

Inclusion criteria were:

- a preoperative diagnosis of non-communicating symptomatic hydrocephalus, e.g. tri-ventricular dilatation due to idiopathic stenosis or tetra-ventricular dilatation secondary to stenosis of the aqueduct of Sylvius with obstruction of the Luschka and Magendie foramina;
- ETV performed by a senior neurosurgeon;
- postoperative follow-up of at least 1 year.

Exclusion criteria were:

- ventricular endoscopy performed for a different indication;
- hydrocephalus first drained by an internal ventricular shunt (IVS).

Our retrospective study permitted analysis of various independent variables (age, sex, diagnostic indicators, preoperative and postoperative imaging results, aetiology, and duration of follow-up). The circumstances leading to diagnosis of non-communicating

hydrocephalus were classified as: intracranial hypertension syndrome (ICHT), chronic active hydrocephalus syndrome, isolated headache, isolated balance impairment, increased head circumference (HC), behavioural disorders, torticollis, visual disorders, and fortuitous. Non-communicating hydrocephalus was confirmed on magnetic resonance imaging (MRI) when a ballooning of the third ventricle revealed increased intraventricular pressure compared to the cerebellomedullary cistern. The aetiologies of hydrocephalus were classified as:

- malformations (idiopathic aqueductal stenosis, Arnold-Chiari malformation type I, ventriculomegaly, atresia of the foramina of Luschka and Magendie);
- secondary to an obstructive mass lesion;
- post-infectious (meningitis).

No post-haemorrhagic hydrocephalus was found in our series.

We divided our population into two groups: paediatric, patients under 16 years of age, and adults.

### 2.3. Characteristics of the population

Our population (Table 1) comprising of 82 consecutive patients (age range 1 month–83 years) was divided into a paediatric group ( $n = 26$ , mean age  $5.9 \pm 5.1$  years; sex ratio: 0.86) and an adult group ( $n = 56$ , mean age  $47.4 \pm 17.1$  years; sex ratio: 1.15).

The predominant symptom leading to diagnosis was ICHT observed in both the paediatric group (42.3%) and the adult group (53.6%). An isolated increase in HC was present in 23.1% of children while 25% of adults complained of chronic hydrocephalus syndrome. More rarely, in children, the circumstances of diagnosis were isolated headache (11.5%) and behavioural disorders (7.7%); we found one case of torticollis, one case of balance disorders and a chronic hydrocephalus syndrome. In the adult group, few people reported isolated balance disorders (12.5%) or isolated headache (7.1%). In our series, visual disturbances were objectified in 5 children (19.2%) and 20 adults (35.7%), but very rarely isolated (1 case adult).

The aetiologies of hydrocephalus were divided into 3 groups: malformations (52.4%), secondary to a mass lesion (42.7%) or an infectious process (4.9%). Idiopathic stenosis of the aqueduct of Sylvius dominated all aetiologies: 50% of children and 41.1% of adults. The nature of bacterial post-infectious hydrocephalus was variable: group B *Streptococcus* in 2 patients, methicillin sensitive *Staphylococcus* in 1 patient and methicillin-resistant *Staphylococcus* for the last patient.

### 2.4. Surgical technique

The patient was placed in supine position, under general anaesthesia, with the head flexed at 5° on a horseshoe headrest. After incision behind the hairline, the surgical protocol began with a burr hole located 1 centimetre in front of the right hemi-coronal suture, on the mid-pupillary line.

A rigid neuro-endoscope (Karl Storz®) with a work shirt of 3 mm diameter and a trocar mounted on a self-static arm, was

Download English Version:

<https://daneshyari.com/en/article/6152102>

Download Persian Version:

<https://daneshyari.com/article/6152102>

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