



Case Report

Management of Hydrocephalus at the Henry Dunant Hospital of the Cameroonian Red Cross in Yaoundé

Prise en Charge de l'Hydrocéphalie à l'Hôpital Henry Dunant de la Croix Rouge Camerounaise

Onambany B, Fankem C, Mvogo Minkala, Nga Nomo S, Djentcheu, Binyom P, Ngowé Ngowé M.

ABSTRACT

Adult hydrocephalus is considered a rare disease in the elderly. Its pathophysiology remains unclear to this day despite the incrimination of several risk factors (arterial hypertension, diabetes, heart rhythm disorders). Axial computed tomography and magnetic resonance are the diagnostic instruments par excellence. Its seemingly simple surgical treatment is based on ventricular bypass. This treatment is often complicated by serious postoperative infections. Hence the need to treat this pathology only in hospitals with a good technical platform. The aim of our work was to prove that the management of hydrocephalus can also be carried out without risk in hospital structures such as the Henry Dunant Hospital of the Cameroon Red Cross in Yaoundé, which implements the infection prevention and control program. We reported 2 cases: a 62-year-old woman and a 72-year-old man who presented similar symptoms, characterized by a gait disorder, cognitive disorders associated with headaches and amnesia. The ECG showed a regular atrial and left ventricular hypertrophy, secondary repolarization disorders. These two patients therefore benefited from a surgical treatment which consists in setting up an internal ventriculoperitoneal bypass valve. The postoperative course was marked by a clear improvement in general condition. No infectious signs or symptoms were observed during this period.

RÉSUMÉ

L'hydrocéphalie de l'adulte est considérée comme une maladie rare chez les personnes âgées. Sa physiopathologie reste à ce jour peu claire malgré l'incrimination de plusieurs facteurs de risque (hypertension artérielle, diabète, troubles du rythme cardiaque). La tomographie axiale et la résonance magnétique sont les instruments diagnostiques par excellence. Son traitement chirurgical, apparemment simple, repose sur la dérivation ventriculaire. Ce traitement est souvent compliqué par des infections postopératoires graves. D'où la nécessité de ne traiter cette pathologie que dans les hôpitaux disposant d'un bon plateau technique. Le but de notre travail était de prouver que la prise en charge de l'hydrocéphalie peut aussi se faire sans risque dans des structures hospitalières comme l'hôpital Henry Dunant de la Croix Rouge Camerounaise à Yaoundé, qui met en œuvre le programme de prévention et de contrôle des infections. Nous avons rapporté 2 cas : une femme de 62 ans et un homme de 72 ans qui ont présenté des symptômes similaires, caractérisés par un trouble de la marche, des troubles cognitifs associés à des céphalées et une amnésie. L'ECG a montré une hypertrophie auriculaire régulière et ventriculaire gauche, des troubles secondaires de la repolarisation. Ces deux patients ont donc bénéficié d'un traitement chirurgical qui consiste en la mise en place d'une valve de dérivation ventriculo-péritonéale interne. Les suites opératoires ont été marquées par une nette amélioration de l'état général. Aucun signe ou symptôme infectieux n'a été observé durant cette période.

Affiliations

1- Henry Dunant Hospital, Cameroonian Red Cross in Yaoundé

Corresponding Author: Onambany Benjamin

Tel: +237 699351667, BP: 631 Yaoundé
Cameroon

Email : onambany@yahoo.fr

Keywords : Management, Hydrocephalus, Henry Dunant Hospital, Computed tomography and magnetic resonance, ventricular bypass, infection prevention and control program.

Mots clés : Prise en charge, Hydrocéphalie, Hôpital Henry Dunant, Tomodensitométrie et Résonance Magnétique, Dérivation Ventriculaire, Programme de Prévention Contrôle des Infections

Article history

Submitted: 10 July 2024

Revisions requested: 6 August 2024

Accepted: 15 August 2024

Published: 30 August 2024

INTRODUCTION

Hydrocephalus refers to an increase in cerebrospinal fluid (CSF) characterized by a triad that combines gait

disorders, neurocognitive deterioration and urinary incontinence [1, 3]. His radiological diagnosis is based on the MRI finding of ventricular enlargement associated with abnormalities in the distribution of cerebrospinal

fluid in the subarachnoid spaces. The frequency of this pathology is (1.3/100,000 inhabitants per year); the prevalence is 3.7%, and the sex ratio equal to 1 [13,14]. Its treatment, solely surgical, is based on the ventriculo-peritoneal (PVD) or ventriculo-atrial (VAD) shunt for communicating hydrocephalus; and ventriculocisternostomy for obstructive hydrocephalus. Seemingly simple, this therapeutic approach is not without the risk of infectious complications: the work of Hamadou Sow in 2015 in Senegal documented an infection rate of 12.3% [15;16] which is why surgery of the hydrocephalus in Cameroon has always been practiced in specialized centers. The management of hydrocephalus at the Cabinet Médical Henry Dunant of the Cameroon Red Cross in Yaoundé allow us to affirm that the techniques of DVP or DVA, as well as that of ventriculo-cisternostomy can be practiced without risk in health structures in 4th degree.

CASE PRESENTATION

There were two cases: a 62-year-old woman and a 72-year-old man who presented similar symptoms, characterized by a gait disorder, cognitive disorders associated with headaches and amnesia. In addition, the 62-year-old patient was admitted with Broca's aphasia, installed two days before her hospitalization. The 72-year-old patient, on the other hand, presented with a sphincter disorder with intermittent urinary incontinence (**Tableau I**).

Table 1. Distribution of patients according to symptoms

Patient 1: 62 year old female

Disorders of urination

Cognitive disorders (headaches, amnesia, memory impairment)

Broca's aphasia

Patient 2: 72 year old male

Gait disorders

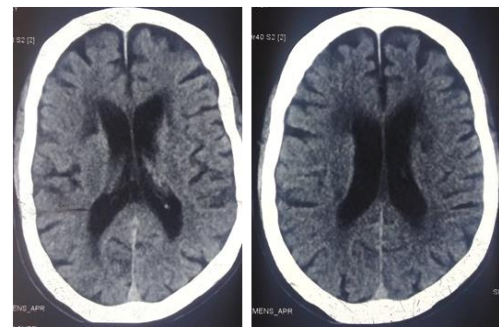
Cognitive disorders (headaches, amnesia, memory impairment)

Sphincter disorders (urinary incontinence)

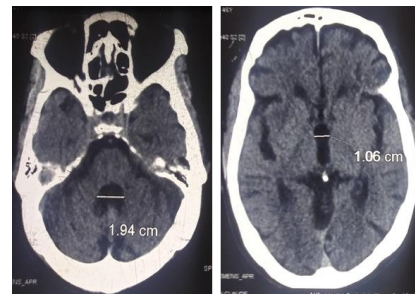
The general condition of the patients was modestly altered. The hematological assessment showed: The hematological assessment showed the normal kidney function with 0,24 g/l value of urea and 13,25 mg/l of creatinine for ionogram, sodium, potassium and chloride have the normal values respectively 138,9 mEq/l; 4,02 mEq/l, and 103,5 mEq/l. The serology of human immunodeficiency virus (HIV) was negative. The blood count showed lymphocytosis and isolated eosinocytosis: (44,2% and 6,4%) because normal values are 20,0- 40,0% and 0,0 - 3,0%. The ECG, on the other hand, was abnormal and showed a regular sinus rhythm at 66 beats per minute, atrial and left ventricular hypertrophy, secondary repolarization disorders.

The MRI examination performed in the 72-year-old patient documented a left occipital punctiform ischemic lesion, normal pressure hydrocephalus (Evans = 0.45) with transependymal resorption and cortical-subcortical atrophy, with bilateral hippocampal involvement (Picture 1). The brain scan performed on the 62-year-old patient

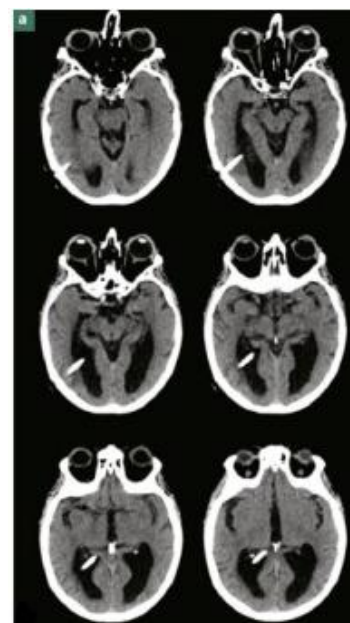
revealed quadriventricular hydrocephalus (Picture 2). These two patients therefore benefited from a surgical treatment which consists in setting up an internal ventriculo-peritoneal bypass valve (**Picture 3**).



Picture 2. Brain scan in a 72 year old male showing the dilatation of the fourth and third ventricles.



Picture 1. Brain scan in a 62 year old female showing the dilatation of both lateral ventricles



Picture 3. Brain scan showing the presence of the drain in the right lateral ventricle postoperatively.

The postoperative course was marked by a clear improvement in general condition. No infectious signs or symptoms were observed during this period.

DISCUSSION

The clinical cases observed in our work refer to elderly patients (62 and 72 years old); which is consistent with the prevalence observed in the elderly, documented in the literature of normal pressure hydrocephalus. Also, our findings agree with those of the work of Marmarou et al. whose average age of the 151 patients studied was 74.9. [19]. In our work, the male-female sex ratio was 1, comparable to that of Marmarou et al. which represented 0.96 (i.e. 49 men, 51 women and 51 children) [19]. Given that a duration of evolution of less than 12 months is associated with a favorable rate of surgical improvement [11, 12], the duration of evolution of hydrocephalus before diagnosis was on average 10 months in our work. . The natural course of normal pressure hydrocephalus is the progression of symptoms over time, with worsening balance gait disturbances and cognitive signs. This deterioration is only partially reversible if the surgical treatment is carried out late [7, 8, 12]. In our work, the primacy of the Adams Hakim triad prevailed with balance and gait disorders and impaired intellectual and psychic faculties. In the literature, the data differ from one study to another [10, 11]. Among the 58 cases identified by Liu et al. [17], 43 patients, or 74%, had a complete triad at the time of diagnosis. Kitagaki et al. reported higher figures: 90% (20). Unlike Bech et al. Who recovered 60% [22]. All of our patients had difficulty walking; as in the series of Liu and all. [17] , or 100% of cases had gait disturbances [17]. This agrees with data from the literature which documented 92.3% of patients with gait disorders [1, 4]. According to Goderkvs [12], gait disturbances are due to compression of the fibers of the pyramidal pathway by ventricular dilation; which explains why these disorders are usually the first symptom to appear and also the first to improve after CSF bypass. Broca's aphasia reported in our work is argued in the literature as a mild disorder, which however can evolve gradually and dominate the picture [1, 2, 4]. Intellectual deterioration is qualified by some authors as curable dementia [1, 2] compared to other demented states such as Alzheimer's or arteriopathy. Bech et al., [22] had reported 75% of intellectual and psychic disorders; Kitagaki and all, [20], Kang and all, [24] found higher figures with respectively 100% and 89.65%.

CONCLUSION

The correlation between the clinical triad of Adams and Hakim (balance, walking, intellectual and physical disorders) and the dilation of the ventricles observed on cerebral computed tomography or cerebral magnetic resonance are sufficient to make the diagnosis of hydrocephalus. at normal pressure in developing countries. Its surgical treatment, most often subject to complications, can be carried out without risk in 4th degree hospitals. A comparative study based on a larger surgical management of this pathology would be necessary to confirm or refute the results of our work.

Conflict of interest

None

REFERENCES

- 1 – Bret PH, Chazal L., Hydrocéphalie chronique de l'Adulte », Neurochirurgie 36, suppl. 1 ; P. 1. 159, 1990
- 2 – Chazal L., Vanneville G., Sheye T., et al., Mise au point sur résorption lymphatique du liquide cérébro-spinal. Revue de la littérature : Bull Assoc. Dnat. 73.p. 222, 1989.
- 3 – Elsenberg H.M MC comb J.G Lorenzo AV. « Cérébrospinal fluid over production and hydrocephalus associated with choroid plexus papilloma ». J Neurosurg. 40. P .381-385. 1974
- 4- Hakim S. Venegas J.G. Burton J.D « the physics of crâniel cavity hydrocephalus and normal pressure hydrocephalus. Mechanical interprétation and math model. Surge Neurol 5. P. 187-260. 1976.
- 5- Kidas S. Yamashina T. Kubota T. étal « A light and électron microscopie and immunohistochemical study of human arachnoïd Vili » J. neurosurg . 69.1 429-438, 1988.
- 6- Lorenzo A, V., page C.K, watters O.V « relationships, between celebro- spinal fluid formation absorption and pressure in human hydrocephalus Brain 93, P. 679-692, 1970
- 7- Nulsen FE, Spitz E.B, « treatment of hydrocephalus by direct shunt from ventricular to jugular vein », Surg forum 2, P. 399-403, 1956
- 8- Renier D, Lacombe J, pierre- Khan A. et al, « factors causing acute shunt infection computer analysis of 1174 opérations » J Neurosurg. 61 P. 1072-1078, 1984.
- 9- Sainte- Rose C, « shunt obstruction; A preventable-complication » Pediatr. Neurosurg. 69. P. 156-164, 1993
- 10- SHINNARS, GAMMON K, Bergman E.W et al, « management of hydrocephalus in infancy; use of a cetazolamide and furosémide to avoid cérébrospinal fluid shunts », J. pediatr. 107, P. 31-37, 1985.
- 11- Vanneste J, van Asker R, « normal pressure hydrocephalus, did publications after management » J Neurol, Neurosurg. Psychiatry, 1990, 53, 564-568
- 12- Vanneste J, Augustin P, Diven C, Tau WF, goedh and Z.D, « shunting normal » pressure hydrocephalus ; do the benefits outweigh the risk ? A mutiplicenter study and littérature review », neurology, 1992, 42 ; 54-59.
- 13- Zaccaria V, Bacigahipo I, Gervasi G canevelli M, Corbo M, Vanacore N, et al. A systematic review on the epidemiology of normal pressure hydrocephalus Acta Neurol scand. Fevri 2020 ; 146 (2) ; 101-14
- 14- Martin- Lae R, Caballero-A rzapele H, Valle- Sau, Roman N, Lopez- Menendez LR Arango- Lasprilla JC, vasquez-Barquero A, Incidence of idiopatic normal pressure hydrocephalus in Northem Spain world neurosurg. Mars 2016 ; 87 ; 298-310
- 15- KLINGE- XHENASLIP, HEISLER HE, FISHER J, KONIG K, VM KELLER M, RICKELS E. cérébral Blood flow in chronic hydrocephalus ; a parameter indicating shunt faillure new aspects Acta neurochirurgie 1998 ; 76 ;374-9
- 16- Cinalli G. Sainte- Rose c, chumas P et A. Faillure of third ventriculostomy in treatment of aqueductal stenosis in children J. Neurosurg 1999; 90; 448-454
- 17- Ann LIU, Eric W. Sankey, Ignacio jusue Torres, Mira A. Patel, Benjamin D, Elder, C. Rosy Godwin, Jamie Haffberger, Jennifer lu, danielle Rigamonti clinical outcomes after ventriculoatrial shunting fer idiopathic normal pressure hydrocephalus. United States Clinical Neurology and Neurosurgery (2016) 34-38
- 18- SAKAKIBARA R, Kanda T, Sekido T, Uchlyamat, Awa Y, O T Lin Z Yamamoto T, Yamanishi T, Yuasa T, Shiral K, Hattori T. Mechanism of bladder dysfunction in idiopathic L normal pressure hydrocephalus neurorol urodyn 2008, 27; 507-10

19- Anthony Marmarou, Harold F. Young, Cunes, A. Aygok, Satoshi Sawanchi, Osamu Tsuji, Takuji, Yamamoto, Jana Dunbar.

Diagnosis and management of idiopathic normal pressure hydrocephalus; a prospective study in 151 patients 5 Neurosurg 102 ;987-997, 2005

20- Kitagaki H, Mori E, Ishil K, Yamaji s, hirono N, Imamura T.

CSF spaces in idiopathic normal pressure hydrocephalus; morphology and volumetry AM journal of Neuroradiology 1998 ;19 1277-1284

21- Marmarou A, bergsnelder M, Kling P, Relkin N, Black PM The value of supplemental prognostic tests for the preoperative assessment of idiopathic normal pressure hydrocephalus. Neurosurgery 2005 ;57 (Suppl) S 17-28

22- Bech R. Waldeman G, G Jerris F, Klinken L, Juher M. S shunting effets in patients with idioparthic normal pressure

hydrocephalus corrélation with cérébral and leptomenigeal and biopsy findings Act or neurochirurgica (wieu), 1999 ;146; 633-639

23- KLing P, Berding G. PET studies in idioparthic chronic hydrocephalus before and after shunt treatment; the rôle of risk factors for cerebro vascular disease and cérébral hemodynamics. Acta Neurochir suppl. 2002; 43-46

24- Kang K. H Wang K. Lee H-W. Shunt response idiopathic normal pressure hydrocephalus patient with delayed improvement after taptest. J korean neurosurg SOC 2013; 54; U37- 40

25- Kling P Marmarou, bergsnelder M. Relkin N, black PM outcome of Shunting in idiopathic normal pressure hydrocephalus and the value of outcome assessment in shunted patient's neurosurgery 2005; 57; 540-52