

Article

Management of subdural chronic hematoma in Colombia: national survey

Marticela Morales-Cabeza, Amit Agrawal, Gabriel Alcala-Cerra, Huber S. Padilla-Zambrano, Andres M. Rubiano, Alfonso Pacheco-Hernandez, Luis Gabriel Moscote-Salazar, Hernando Alvis-Miranda, Luis Rafael Moscote-Salazar
COLOMBIA, INDIA, VENEZUELA



DE GRUYTER
OPEN

DOI: 10.1515/romneu-2017-0031

Management of subdural chronic hematoma in Colombia: national survey

Marticela Morales-Cabeza¹, Amit Agrawal², Gabriel Alcala-Cerra³, Huber S. Padilla-Zambrano¹, Andres M. Rubiano⁴, Alfonso Pacheco-Hernandez⁵, Luis Gabriel Moscote-Salazar⁶, Hernando Alvis-Miranda¹, Luis Rafael Moscote-Salazar⁵

¹University of Cartagena, Cartagena de Indias, COLOMBIA

²Department of Neurosurgery, Narayna Medical College Hospital, Chinthareddypalem, Andhra Pradesh, INDIA

³E.S.E Hospital Universitario CARI, Barranquilla, COLOMBIA; Department of Neurological Research, Health Sciences and Neurosciences (CISNEURO) Research Group, University of Cartagena, Cartagena de Indias, COLOMBIA

⁴Hospital Universitario de Neiva-Fundacion Meditech, Neiva, Universidad El Bosque, Bogota, COLOMBIA

⁵Department of Neurological Research, Health Sciences and Neurosciences (CISNEURO) Research Group, University of Cartagena, Cartagena de Indias, COLOMBIA

⁶Hospital Universitario de Maracaibo, Universidad del Zulia, Maracaibo, VENEZUELA

Abstract: Chronic subdural hematoma is a growing neurological pathology, especially in older people. Thus, describing how this entity is approached in Colombia is of great importance because it allows to evaluate and contrast this approach with that of other countries, comparing the techniques used, therapeutic management and additional measures. In this study, this comparison was carried out using a self-administered survey with 16 multiple-choice items. The results were evaluated in Microsoft Excel, determining measures of central tendency accompanied by frequencies and percentages. As an initial management, 75.5% preferred to use 1 Burr Hole and, in cases of recurrence, craniotomy is the choice in 50% of cases. Regarding the placement of drainage, its use was estimated to be 83.3%, especially the subdural system closed to external drainage, with a preference of 85.2%, and without use of corticosteroids as adjuvant therapy in 88.9 % of respondents. These data are consistent with the results of studies in other countries regarding the management of this pathology.

Key words: Chronic subdural hematoma; Craniotomy, Neurosurgery

Introduction

Chronic subdural hematoma (HSC) is one of the most common neurological pathologies (1-4), with an incidence of 3.4 per 100,000 population in patients younger than 65 years of age and 8-58 per 100,000 in older adults. 65 years (5, 6), being more frequent in the male sex, (7) people with risks of falls, convulsions, alcohol abuse, coagulation disorders (2, 8) and associated medicines (9). Its origin begins from the formation of acute hematomas, which may resolve spontaneously or increase in size and continue to enlarge, generating rupture of small veins as it expands, further increasing the amount of blood and thus becoming a HSC8, (10). It is rarely produced as a complication of cuts of unbroken cerebral aneurysms (11). Its diagnosis is performed by imaging, mainly CT scan and magnetic resonance imaging (MRI). (12) The treatment options include craniotomy, Burr Hole craniostomy (BHC), Twist drill craniostomy (TDC), endoscopic management and Medical management; however, there is still no consensus on the technique of choice. (8)

On the other hand, the use of preventive measures to reduce recurrence has been implemented, including: Use of corticosteroids, angiotensin receptor antagonists, correct positioning of the head postoperatively, continuous subdural irrigation, among others (13). Despite this, recurrence rates have been reported from 6.6 to 38% and mortality rates of 3.8% (8). This high recurrence rate, coupled with the prevalence of this condition, raises the need to know how this pathology is approached in

Colombia, the conditions that could be influencing this method and, at the same time, to evaluate the implications that this may have on the patient.

Materials and methods

A descriptive observational study was performed. We included 54 participants who were part of the medical staff of some Colombian institutions. As the only criterion of inclusion, it was necessary that participation should be voluntary, after signing an informed consent. A survey was carried out using a virtual platform (ww.encuestafacil.com), which consisted of 16 multiple-choice questions related to the management of HSC, and had variables such as: academic training (place of training in general neurosurgery and Profession), use of surgical techniques (Burr hole, twist drill, others), use of drugs (steroids, anticonvulsants, antibiotics), use of devices (drains) and other measures.

The data were entered in a database in Microsoft Excel and analyzed using the same program, using descriptive statistics by means of determination of measures of central tendency, frequency and percentages, according to the options marked in the survey.

Results

Socio-demographic characteristics

Of the 54 participants in the study, 92.6% (50) were men, with a male: female ratio of approximately 13: 1. The countries where Neurosurgery was performed were Colombia with 43 subjects (79.6%), followed by other countries in Central and South America with 8

subjects (14.8%), North America with 2 (3.7 %) And another continent 1 subject (1.9%). As for their profession, 77.8% of the respondents were general neurosurgeons and 12.2% had another sub-specialty.

Surgical aspects

As for the initial management of the patient, the technique of choice was 1 Burr Hole, with a prevalence of 75.5% when compared to the others (Figure 1). The technique of choice in cases of recurrence was also evaluated (Table 1). The irrigation of the dural cavity during the surgical procedure and the use of drains at the end were reported in high proportions, with values of 85.2% and 83 % respectively.

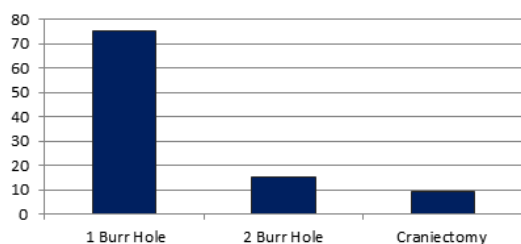


Figure 1 - Technique of preference in the initial management of HSC

TABLE 1

Technique of choice in the management of recurrent HSC

	Number of patients	(%)
Twist Drill	1	1,9
1 Burr hole	18	33,3
2 Burr hole	7	13
Subdural Peritoneal Shunt	1	1,9
Craniectomy	27	50
Total	54	100

Use of medicines

Regarding the management of patients in whom there were no seizures, 88.9% of the participants did not use anticonvulsants, and 11.1% used them, administered for less than 1 day (1.9%) or 7 to 5 days (9.3%). The use of antibiotics was also investigated, evidencing a significant use of these in a preoperative (83.3%) and postoperative (64.8%), with a predominance of 82.7% for cephalosporins, 17% for others Types (except for fluoroquinolones and penicillin, of which no use was reported by specialists in the management of this pathology). Another of the drugs evaluated was the use of systemic steroids as one of the measures for the management of patients with HSC, evidencing that 48 (88.9%) of the respondents deny their use compared to only 6 (11.1%) That allow you to use it.

Other measures

The implementation of other additional measures for the management of HSC, such as the use of the head in zero degrees in the 24 hours post-surgical were studied, reporting that 70.4% of the respondents use this measure, compared to 29.6% who refrain from using it. The use of drains was also evaluated, revealing that 46 of the participants (85.2%) prefer a subdural system closed to external drainage, 2 (3.7%) prefer a closed subgaleal system to external drainage, while 6 of them (11.1%) did not use any drains. Regarding the perception about the importance of age as a determinant of the surgical decision, 77.8% considered that it is not a determining parameter when deciding to intervene, while the other 22.2% consider it important.

Discussion

The HSC is one of the neurological pathologies that is reported more frequently (1). Its handling must be in charge of a trained professional. In the present study, 77% of the participants who perform the approach of these patients are general neurosurgeons, compared to 22% who have a subspecialty, which reflects that due to the high frequency of this pathology, the management by a general neurosurgeon is more frequent, having all the capacities and training to be able to offer him of equal way, an adequate attention to the patient, without that this has negative repercussion in the morbidity and mortality. The training country of the majority of the participants was Colombia; A fact that can be explained by the lack of opportunities for specialization abroad, personal preferences or socioeconomic issues. Determining the cause of this result would require another study that is not the subject of this article.

The variety of surgical techniques to intervene to these patients, generates controversy about the procedure of choice; (Burr-Hole 1, 8 of these (15.1%) 2 Burr-Hole and only 5 (9.4%) the craniectomy. These data coincide with those observed in countries like Nigeria (14) and other studies where the first two techniques are of choice (15) mainly due to the low rates of recurrence reported (8-26%). Irrigation of the subdural space in a systematic way (2, 14, 16) and that in our country is reported in 85.2% of cases.

Regarding the procedure of choice in cases of recurrence, the most used was the craniotomy, followed by the 1 Burr Hole, 2 Burr Hole, and TDC, which contrasts with

other studies where BHC occupies the first place, followed by the TDC, The latter considered advantageous because it can be performed at the patient's bedside with the use of local anesthesia, together with cost and time saving (8). This difference could be given by the population studied, places of training and access to certain materials and procedures. Therefore, the technique of choice may vary depending on where the intervention is performed, without representing malpractice or prejudice to the patient.

The use of antibiotics is one of the main measures used in any type of surgery and has been shown to be largely used prophylactically in the pre- and postoperative phase to treat HSC (83.3% and 64, 8% respectively). However, there is little information in the literature about its use, dosage, duration and types of recommended antibiotics. In most scenarios where they are used, it is a way of intervening for an existing infection (17). Within the medication given to the patient, the anticonvulsants have been routinely used in the post-surgical period, based on the concept that after the intervention, patients may frequently exhibit some extent of the underlying traumatic brain injury, thus establishing a risk factor for seizures. (6) Although the data indicate that 88.9% do not use them, 9.7% use it for 5 to 7 days and 1% use it only in the first hours. Despite this, its use is not yet considered as a routine or standardized practice (14). The role of inflammation as a determinant in the pathophysiological process of HSC has been known for several years. Despite this, the use of steroids as additional therapy is limited in many countries (14)

including Colombia, due to limited clinical evidence of its effectiveness and cost-benefit relationship (18, 19).

In countries like Canada, abstention from its use occurs in more than 80% of neurosurgeons (18). After surgery, most neurosurgeons place a subdural system closed to external drainage. It has been shown that its use after the evacuation of a HSC can accelerate the washing of inflammatory and fibrinolytic factors confined within the subdural cavity, thus decreasing its recurrence (2, 13, 20). In spite of this, the use of subdural drainage is not a systematic practice in all countries. In the present study, 83.3% place a drainage at the end of the surgical procedure, and in countries such as Nigeria, The use is 42.8%, (14) whereas a survey in the United Kingdom and the Republic of Ireland showed that only 11% of neurosurgeons always place a drain (11).

Concern for surgical risk is one of the main Reasons why some neurosurgeons avoid their use, due to the fear of: perforation of the cortex, generation of a subdural hematoma or the formation of a subdural empyema bacterial (12). With respect to prognosis and conceptions about the intervention, more than 70% of the participants consider that age is not a determining factor when evaluating a possible intervention, which indicates that the majority of patients who enter and are not candidates for Medical treatment, will have the opportunity to be managed surgically to seek the final resolution of your picture. This generates higher cure rates and is consistent with other countries (1).

Despite this, there are reports that young

patients tend to have a better outcome. (21) But despite this controversy, this should not be a reason to delay or deny intervention in older patients and more so because they are the first group affected.

After the surgical intervention, the adoption of measures such as variation in the position on the stretcher, have been considered as support tools. Although 70.4% of the participants use the head in zero degrees; In other places, Trendelenburg position is used in order to increase cerebrospinal fluid (CSF) pressure and help brain reexpansion. Despite this, the results are considered contradictory, and the role of the positions as stimulants or inhibitors of recurrence has not been determined. (14)

Regarding the limitations of the study, it should be clarified that equal proportions of respondents from each of the participating hospital centers were not taken into account, which would make it ideal to carry out another study that includes a greater number of professionals from other regions of the country. Country, to confirm if the results obtained are similar or consistent with those of the present study. In addition, the fact that the majority of participants presented their training in this country could have influenced the results obtained.

Conclusion

Chronic subdural hematoma is a pathology that in Colombia is approached mainly by the general neurosurgeon, and whose treatment agrees with most measures adopted in other countries at the intervention level of choice, medication use and additional measures.

Correspondence

Dr. Luis Rafael Moscote-Salazar

Email: mineurocirujano@aol.com

References

- 1.Lo W-L, Lee T-C, Fang P-S, Huang Y-H. Chronic subdural hematoma in patients under age 65 years: A comparative study of age cohort. *Formosan Journal of Surgery* 2013;46:10-14.
- 2.Bellut D, Woernle CM, Burkhardt J-K, Kockro RA, Bertalanffy H, Krayenbühl N. Subdural Drainage versus Subperiosteal Drainage in Burr-Hole Trepanation for Symptomatic Chronic Subdural Hematomas. *World Neurosurg* 2012;77:111-118.
- 3.Santarius T, Qureshi HU, Sivakumaran R, Kirkpatrick PJ, Kirillos RW, Hutchinson PJ. The Role of External Drains and Peritoneal Conduits in the Treatment of Recurrent Chronic Subdural Hematoma. *World Neurosurg* 2010;73:747-750.
- 4.Singla A, Jacobsen WP, Yusupov IR, Carter DA. Subdural evacuating port system (SEPS)-Minimally invasive approach to the management of chronic/subacute subdural hematomas. *ResearchGate* 2012;115.
- 5.Aspegren OP, Åstrand R, Lundgren MI, Romner B. Anticoagulation therapy a risk factor for the development of chronic subdural hematoma. *Clin Neurol Neurosurg* 2013;115:981-984.
- 6.Ducruet AF, Grobelny BT, Zacharia BE, et al. The surgical management of chronic subdural hematoma. *Neurosurg Rev* 2012;35:155-169.
- 7.Marshman LAG, Manickam A, Carter D. Risk factors for chronic subdural haematoma formation do not account for the established male bias. *Clin Neurol Neurosurg* 2015;131:1-4.
- 8.Singh SK, Sinha M, Singh VK, et al. A randomized study of twist drill versus burr hole craniostomy for treatment of chronic subdural hematomas in 100 patients. *The Indian Journal of Neurotrauma* 2011;8:83-88.
- 9.Vladila A-M, Mitrea D-A, Nica S, et al. Chronic subdural hematoma: a case report and review of the literature. *Romanian Journal of Neurology* 2014;13:35.
- 10.Kumar P, Kiran U. Management of chronic subdural haematoma: Single burr-hole drainage and irrigation using the technique of "syringing". *The Indian Journal of Neurotrauma* 2013;10:105-108.
- 11.Inamasu J, Watabe T, Ganaha T, et al. Clinical characteristics and risk factors of chronic subdural haematoma associated with clipping of unruptured cerebral aneurysms. *Journal of Clinical Neuroscience* 2013;20:1095-1098.
- 12.Ahmed S, Agrawal D, Kale SS, Mahapatra AK. A comparative study of treatment of chronic subdural hematoma — burr hole drainage versus continuous closed drainage. *The Indian Journal of Neurotrauma* 2011;8:17-23.
- 13.Alcalá-Cerra G, Young AMH, Moscote-Salazar LR, Paternina-Caicedo A. Efficacy and safety of subdural drains after burr-hole evacuation of chronic subdural hematomas: systematic review and meta-analysis of randomized controlled trials. *World Neurosurg* 2014;82:1148-1157.
- 14.Rabiu TB. Chronic subdural hematoma: A survey of neurosurgeons' practices in Nigeria. *Surg Neurol Int* 2013;4:58.
- 15.Smith MD, Kishikova L, Norris JM. Surgical management of chronic subdural haematoma: One hole or two? *International Journal of Surgery* 2012;10:450-452.
- 16.Adachi A, Higuchi Y, Fujikawa A, et al. Risk Factors in Chronic Subdural Hematoma: Comparison of Irrigation with Artificial Cerebrospinal Fluid and Normal Saline in a Cohort Analysis. *PLOS ONE* 2014;9:e103703.
- 17.Aslan A, Eser O, Coşar M, Albayrak R. Salmonella-infected chronic subdural hematoma. *ResearchGate* 2009;39:139-142.
- 18.Santarius T, Lawton R, Kirkpatrick PJ, Hutchinson PJ. The management of primary chronic subdural haematoma: A questionnaire survey of practice in the United Kingdom and the Republic of Ireland. *ResearchGate* 2008;22:529-534.
- 19.Berghauser Pont LME, Dirven CMF, Dippel DWJ, Verweij BH, Dammers R. The role of corticosteroids in the management of chronic subdural hematoma: a systematic review. *Eur J Neurol* 2012;19:1397-1403.
- 20.Santarius T, Kirkpatrick PJ, Ganesan D, et al. Use of drains versus no drains after burr-hole evacuation of chronic subdural haematoma: a randomised controlled trial. *Lancet* 2009;374:1067-1073.
- 21.Sarma P, Indira Devi B, Shukla DP, Bhat DI. Subacute and chronic subdural hematoma in young population less than 40 years. *The Indian Journal of Neurotrauma* 2014;11:1-4.