# World Journal of *Clinical Cases*

World J Clin Cases 2021 October 6; 9(28): 8280-8626





Published by Baishideng Publishing Group Inc

W J C C World Journal of Clinical Cases

#### Contents

#### Thrice Monthly Volume 9 Number 28 October 6, 2021

#### **REVIEW**

8280 Transmission of severe acute respiratory syndrome coronavirus 2 via fecal-oral: Current knowledge

Silva FAFD, de Brito BB, Santos MLC, Marques HS, da Silva Júnior RT, de Carvalho LS, de Sousa Cruz S, Rocha GR, Santos GLC, de Souza KC, Maciel RGA, Lopes DS, Silva NOE, Oliveira MV, de Melo FF

8295 Nutrition, nutritional deficiencies, and schizophrenia: An association worthy of constant reassessment Onaolapo OJ, Onaolapo AY

#### **MINIREVIEWS**

8312 Grounded theory qualitative approach from Foucault's ethical perspective: Deconstruction of patient selfdetermination in the clinical setting

Molina-Mula J

Diabetes mellitus and COVID-19: Understanding the association in light of current evidence 8327

Sen S, Chakraborty R, Kalita P, Pathak MP

#### **ORIGINAL ARTICLE**

#### **Case Control Study**

8340 Pregnancy complications effect on the nickel content in maternal blood, placenta blood and umbilical cord blood during pregnancy

Ding AL, Hu H, Xu FP, Liu LY, Peng J, Dong XD

#### **Retrospective Study**

8349 Clinical observation of Kuntai capsule combined with Fenmotong in treatment of decline of ovarian reserve function

Lin XM, Chen M, Wang QL, Ye XM, Chen HF

8358 Short-term effect and long-term prognosis of neuroendoscopic minimally invasive surgery for hypertensive int-racerebral hemorrhage

Wei JH, Tian YN, Zhang YZ, Wang XJ, Guo H, Mao JH

8366 Ultrasonographic assessment of cardiac function and disease severity in coronary heart disease

Zhang JF, Du YH, Hu HY, Han XQ

8374 COVID-19 among African Americans and Hispanics: Does gastrointestinal symptoms impact the outcome?

Ashktorab H, Folake A, Pizuorno A, Oskrochi G, Oppong-Twene P, Tamanna N, Mehdipour Dalivand M, Umeh LN, Moon ES, Kone AM, Banson A, Federman C, Ramos E, Awoyemi EO, Wonni BJ, Otto E, Maskalo G, Velez AO, Rankine S, Thrift C, Ekwunazu C, Scholes D, Chirumamilla LG, Ibrahim ME, Mitchell B, Ross J, Curtis J, Kim R, Gilliard C, Mathew J, Laiyemo A, Kibreab A, Lee E, Sherif Z, Shokrani B, Aduli F, Brim H



Combon	World Journal of Clinical Cases
Conten	Thrice Monthly Volume 9 Number 28 October 6, 2021
	Observational Study
8388	Validated tool for early prediction of intensive care unit admission in COVID-19 patients
	Huang HF, Liu Y, Li JX, Dong H, Gao S, Huang ZY, Fu SZ, Yang LY, Lu HZ, Xia LY, Cao S, Gao Y, Yu XX
8404	Comparison of the impact of endoscopic retrograde cholangiopancreatography between pre-COVID-19 and current COVID-19 outbreaks in South Korea: Retrospective survey
	Kim KH, Kim SB
	Randomized Controlled Trial
8413	Effect of family caregiver nursing education on patients with rheumatoid arthritis and its impact factors: A randomized controlled trial
	Li J, Zhang Y, Kang YJ, Ma N
	SYSTEMATIC REVIEWS
8425	Dealing with hepatic artery traumas: A clinical literature review
0120	Dilek ON, Atay A
8441	Clinical considerations for critically ill COVID-19 cancer patients: A systematic review
0441	Ramasamy C, Mishra AK, John KJ, Lal A
	CASE REPORT
8453	Atypical granular cell tumor of the urinary bladder: A case report
	Wei MZ, Yan ZJ, Jiang JH, Jia XL
8461	Hepatocyte nuclear factor 1B mutation in a Chinese family with renal cysts and diabetes syndrome: A case report
	Xiao TL, Zhang J, Liu L, Zhang B
8470	Ultrasound features of primary non-Hodgkin's lymphoma of the palatine tonsil: A case report
	Jiang R, Zhang HM, Wang LY, Pian LP, Cui XW
8476	Percutaneous drainage in the treatment of intrahepatic pancreatic pseudocyst with Budd-Chiari syndrome: A case report
	Zhu G, Peng YS, Fang C, Yang XL, Li B
8482	Postmenopausal women with hyperandrogenemia: Three case reports
	Zhu XD, Zhou LY, Jiang J, Jiang TA
8492	Extremely high titer of hepatitis B surface antigen antibodies in a primary hepatocellular carcinoma patient: A case report
	Han JJ, Chen Y, Nan YC, Yang YL
8498	Surgical treatment of liver metastasis with uveal melanoma: A case report
	Kim YH, Choi NK



	World Journal of Clinical Cases
Contei	nts Thrice Monthly Volume 9 Number 28 October 6, 2021
8504	Intermittent appearance of right coronary fistula and collateral circulation: A case report
	Long WJ, Huang X, Lu YH, Huang HM, Li GW, Wang X, He ZL
8509	Synchronous concomitant pancreatic acinar cell carcin and gastric adenocarcinoma: A case report and review of literature
	Fang T, Liang TT, Wang YZ, Wu HT, Liu SH, Wang C
8518	Spontaneous resolution of gallbladder hematoma in blunt traumatic injury: A case report
	Jang H, Park CH, Park Y, Jeong E, Lee N, Kim J, Jo Y
8524	Rupture of ovarian endometriotic cyst complicated with endometriosis: A case report
	Wang L, Jiang YJ
8531	Rotarex mechanical thrombectomy in renal artery thrombosis: A case report
	Li WR, Liu MY, Chen XM, Zhang ZW
8537	Necrotizing fasciitis of cryptoglandular infection treated with multiple incisions and thread-dragging therapy: A case report
	Tao XC, Hu DC, Yin LX, Wang C, Lu JG
8545	Endoscopic joint capsule and articular process excision to treat lumbar facet joint syndrome: A case report
	Yuan HJ, Wang CY, Wang YF
8552	Spinocerebellar ataxia type 3 with dopamine-responsive dystonia: A case report
	Zhang XL, Li XB, Cheng FF, Liu SL, Ni WC, Tang FF, Wang QG, Wang XQ
8557	Disseminated soft tissue diffuse large B-cell lymphoma involving multiple abdominal wall muscles: A case report
	Lee CH, Jeon SY, Yhim HY, Kwak JY
8563	Genetic characteristics of a patient with multiple primary cancers: A case report
	Ouyang WW, Li QY, Yang WG, Su SF, Wu LJ, Yang Y, Lu B
8571	Hypereosinophilia with cerebral venous sinus thrombosis and intracerebral hemorrhage: A case report and review of the literature
	Song XH, Xu T, Zhao GH
8579	Itraconazole therapy for infant hemangioma: Two case reports
	Liu Z, Lv S, Wang S, Qu SM, Zhang GY, Lin YT, Yang L, Li FQ
8587	One-stage total hip arthroplasty for advanced hip tuberculosis combined with developmental dysplasia of the hip: A case report
	Zhu RT, Shen LP, Chen LL, Jin G, Jiang HT
8595	Pneumocystis jirovecii and Legionella pneumophila coinfection in a patient with diffuse large B-cell lymphoma: A case report
	Wu WH, Hui TC, Wu QQ, Xu CA, Zhou ZW, Wang SH, Zheng W, Yin QQ, Li X, Pan HY



World Journal of Clinical Cases
ts Thrice Monthly Volume 9 Number 28 October 6, 2021
Delayed massive cerebral infarction after perioperative period of anterior cervical discectomy and fusion: A case report
Jia F, Du CC, Liu XG
Cortical bone trajectory fixation in cemented vertebrae in lumbar degenerative disease: A case report
Chen MM, Jia P, Tang H
Primary intramedullary melanocytoma presenting with lower limbs, defecation, and erectile dysfunction: A case report and review of the literature
Liu ZQ, Liu C, Fu JX, He YQ, Wang Y, Huang TX



#### Contents

Thrice Monthly Volume 9 Number 28 October 6, 2021

#### **ABOUT COVER**

Editorial Board Member of World Journal of Clinical Cases, Domenico De Berardis, MD, PhD, Adjunct Professor, Chief Doctor, NHS, Department of Mental Health, Teramo 64100, Italy. domenico.deberardis@aslteramo.it

#### **AIMS AND SCOPE**

The primary aim of World Journal of Clinical Cases (WJCC, World J Clin Cases) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

#### **INDEXING/ABSTRACTING**

The WJCC is now indexed in Science Citation Index Expanded (also known as SciSearch®), Journal Citation Reports/Science Edition, Scopus, PubMed, and PubMed Central. The 2021 Edition of Journal Citation Reports® cites the 2020 impact factor (IF) for WJCC as 1.337; IF without journal self cites: 1.301; 5-year IF: 1.742; Journal Citation Indicator: 0.33; Ranking: 119 among 169 journals in medicine, general and internal; and Quartile category: Q3. The WJCC's CiteScore for 2020 is 0.8 and Scopus CiteScore rank 2020: General Medicine is 493/793.

#### **RESPONSIBLE EDITORS FOR THIS ISSUE**

Production Editor: Yan-Xia Xing; Production Department Director: Yu-Jie Ma; Editorial Office Director: Jin-Lei Wang.

NAME OF JOURNAL	INSTRUCTIONS TO AUTHORS
World Journal of Clinical Cases	https://www.wjgnet.com/bpg/gerinfo/204
ISSN	GUIDELINES FOR ETHICS DOCUMENTS
ISSN 2307-8960 (online)	https://www.wjgnet.com/bpg/GerInfo/287
LAUNCH DATE	GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH
April 16, 2013	https://www.wjgnet.com/bpg/gerinfo/240
FREQUENCY	PUBLICATION ETHICS
Thrice Monthly	https://www.wjgnet.com/bpg/GerInfo/288
EDITORS-IN-CHIEF	PUBLICATION MISCONDUCT
Dennis A Bloomfield, Sandro Vento, Bao-Gan Peng	https://www.wjgnet.com/bpg/gerinfo/208
EDITORIAL BOARD MEMBERS	ARTICLE PROCESSING CHARGE
https://www.wjgnet.com/2307-8960/editorialboard.htm	https://www.wjgnet.com/bpg/gerinfo/242
PUBLICATION DATE	STEPS FOR SUBMITTING MANUSCRIPTS
October 6, 2021	https://www.wjgnet.com/bpg/GerInfo/239
COPYRIGHT	ONLINE SUBMISSION
© 2021 Baishideng Publishing Group Inc	https://www.f6publishing.com

© 2021 Baishideng Publishing Group Inc. All rights reserved. 7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA E-mail: bpgoffice@wjgnet.com https://www.wjgnet.com



W J C C World Journal of Clinical Cases

Submit a Manuscript: https://www.f6publishing.com

World J Clin Cases 2021 October 6; 9(28): 8358-8365

DOI: 10.12998/wjcc.v9.i28.8358

ISSN 2307-8960 (online)

ORIGINAL ARTICLE

# **Retrospective Study** Short-term effect and long-term prognosis of neuroendoscopic minimally invasive surgery for hypertensive int-racerebral hemorrhage

Jian-Hui Wei, Ya-Nan Tian, Ya-Zhao Zhang, Xue-Jing Wang, Hong Guo, Jian-Hui Mao

ORCID number: Jian-Hui Wei 0220-0123-0000-0002: Ya-Nan Tian 0000-0002-1146-0331; Ya-Zhao Zhang 0000-0003-4386-2068; Xue-Jing Wang 0000-0003-4487-0086; Hong Guo 0000-0002-9028-8890; Jian-Hui Mao 0000-0003-4287-1341.

Author contributions: Wei JH and Tian YN design the experiment; Zhang YZ drafted the work; Wang XJ, Guo H and Mao JH collected the data; Wei JH and Tian YN analysed and interpreted data; Wei JH, Tian YN and Zhang YZ wrote the article.

Institutional review board

statement: This study was approved by the Harrison International Peace Hospital Ethics Committee.

Informed consent statement: All study participants, or their legal guardian, provided informed written consent prior to study enrollment.

Conflict-of-interest statement: The author declares that there is no conflict of interest between them

Data sharing statement: No additional data are available.

Open-Access: This article is an

Jian-Hui Wei, Department of Neurosurgery, Harrison International Peace Hospital, Hengshui 053000, Hebei Province, China

Ya-Nan Tian, Ya-Zhao Zhang, Xue-Jing Wang, Hong Guo, Jian-Hui Mao, Department of Neurology, Harrison International Peace Hospital, Hengshui 053000, Hebei Province, China

Corresponding author: Jian-Hui Mao, MD, Chief Doctor, Department of Neurology, Harrison International Peace Hospital, No. 180 Renmin East Road, Taocheng District, Hengshui 053000, Hebei Province, China. weijianhui2005@126.com

## Abstract

#### BACKGROUND

Hypertensive intracerebral hemorrhage is a common critical disease of the nervous system, comprising one fifth of all acute cerebrovascular diseases and has a high disability and mortality rate. It severely affects the patients' quality of life.

#### AIM

To analyze the short-term effect and long-term prognosis of neuroendoscopic minimally invasive surgery for hypertensive intracerebral hemorrhage.

#### **METHODS**

From March 2018 to May 2020, 118 patients with hypertensive intracerebral hemorrhage were enrolled in our study and divided into a control group and observation group according to the surgical plan. The control group used a hardchannel minimally invasive puncture and drainage procedure. The observation group underwent minimally invasive neuroendoscopic surgery. The changes in the levels of serum P substances (SP), inflammatory factors [tumor necrosis factorα, interleukin-6 (IL-6), IL-10], and the National Hospital Stroke Scale (NIHSS) and Barthel index scores were recorded. Surgery related indicators and prognosis were compared between the two groups.

#### RESULTS

The operation time  $(105.26 \pm 28.35)$  of the observation group was min longer than that of the control group, and the volume of intraoperative bleeding was  $45.36 \pm$ 10.17 mL more than that of the control group. The hematoma clearance rates were  $88.58\% \pm 4.69\%$  and  $94.47\% \pm 4.02\%$  higher than those of the control group at 48 h



open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: htt p://creativecommons.org/License s/by-nc/4.0/

Manuscript source: Unsolicited manuscript

Specialty type: Neurosciences

Country/Territory of origin: China

#### Peer-review report's scientific quality classification

Grade A (Excellent): 0 Grade B (Very good): B Grade C (Good): C Grade D (Fair): 0 Grade E (Poor): 0

Received: May 27, 2021 Peer-review started: May 27, 2021 First decision: June 24, 2021 Revised: July 2, 2021 Accepted: August 5, 2021 Article in press: August 5, 2021 Published online: October 6, 2021

P-Reviewer: Arraez-Sanchez MA, Thomale UW S-Editor: Ma YJ L-Editor: A P-Editor: Zhang YL



and 72 h, respectively. Good prognosis rate (86.44%) was higher in the observation group than in the control group, and complication rate (5.08%) was not significantly different from that of the control group (P > 0.05). The SP level and Barthel index score of the two groups increased (P < 0.05) and the inflammatory factors and NIHSS score decreased (P < 0.05). The cytokine levels, NIHSS score, and Barthel index score were better in the observation group than in the control group (P < 0.05).

#### **CONCLUSION**

Neuroendoscopic minimally invasive surgery is more complicated than hard channel minimally invasive puncture drainage in the treatment of hypertensive intracerebral hemorrhage; however, hematoma clearance is more thorough, and the short-term effect and long-term prognosis are better than hard channel minimally invasive puncture drainage.

Key Words: Neuroendoscopic minimally invasive surgery; Hard-channel minimally invasive puncture drainage; Hypertensive intracerebral hemorrhage; Prognosis Hematoma clearance

©The Author(s) 2021. Published by Baishideng Publishing Group Inc. All rights reserved.

Core Tip: By comparing the surgical effects of hard channel minimally invasive drainage and neuroendoscopic minimally invasive surgery in hypertensive cerebral hemorrhage, it is confirmed that the latter is relatively complicated compared with the former, but the hematoma is removed more thoroughly and the prognosis is better.

Citation: Wei JH, Tian YN, Zhang YZ, Wang XJ, Guo H, Mao JH. Short-term effect and longterm prognosis of neuroendoscopic minimally invasive surgery for hypertensive int-racerebral hemorrhage. World J Clin Cases 2021; 9(28): 8358-8365

URL: https://www.wjgnet.com/2307-8960/full/v9/i28/8358.htm

DOI: https://dx.doi.org/10.12998/wjcc.v9.i28.8358

## INTRODUCTION

Hypertensive intracerebral hemorrhage is a common clinical critical illness of the nervous system, accounting for one-fifth of all acute cerebrovascular diseases with a high incidence of disability and mortality<sup>[1]</sup>. Various factors cause the blood vessels in the brain to rupture into the brain parenchyma. Nearly a quarter of patients die within one day of illness due to the disease. The mortality rate in one month is greater than 50%[2] having a serious impact on the quality of life of patients. Some Chinese scholars report that the incidence of hypertensive cerebral hemorrhage is 50-80 people per 100000, with the highest rate of death and disability among various types of strokes. Presently, operative treatment is a significant therapy for hypertensive intracerebral hemorrhage[3]. Operative treatment aims at clearing the intracranial hematoma and relieving intracranial pressure effectively, thus reducing secondary brain injury. Currently, hard-channel minimally invasive puncture drainage and neuroendoscopic minimally invasive surgery are the common methods<sup>[4]</sup>. Both these methods have advantages, such as minimal invasion, quick recovery, excellent prognosis, etc. However, there are no reports comparing these two methods in clinical practice[5]. Therefore, the objective of this study was to compare the effects of hard-channel minimally invasive puncture drainage and neuroendoscopic minimally invasive surgery on hypertensive intracerebral hemorrhage.

### MATERIALS AND METHODS

#### General information

We enrolled 118 patients with hypertensive intracerebral hemorrhage in our hospital



from March 2018 to May 2020; they were divided into two groups on the basis of operation strategy. The control group underwent hard-channel minimally invasive puncture drainage and the observation group underwent neuroendoscopic minimally invasive surgery. Each group had 59 cases. The inclusion criteria were as follows: (1) Conforming to the standard of "all kinds of cerebrovascular disease diagnosis", and diagnosed as supratentorial hematoma on head computed tomography (CT); (2) Age  $\geq$ 18 years, and  $\leq$  75 years; (3) Was the first episode and a score of Glasgow Coma Scale  $\geq$ 6; (4) Traditional craniotomy was intolerable; (5) Admission time < 24 h; and (6) Clinical information was integrated. The exclusion criteria were as follows: (1) Patient with herniation of the brain; (2) Volumes of hemorrhage < 20 mL or > 70 mL; (3) Hemorrhage from ruptured intracranial aneurysm or cerebrovascular malformation; (4) Combined with principal organs diseases of the heart, liver and kidney; (5) Patients with disordered coagulation mechanism; and (6) Used antibiotics, glucocorticoid and immunosuppressant treatment for a long time.

#### Methods

In the control group, we carried out hard-channel minimally invasive puncture drainage, conducted CT positioning after moderate local anesthesia to confirm the depth of hematoma and angle of puncture, usually selecting the maximum level center of hematoma as the target of puncture, and avoiding blood vessels and important functional areas. The incision was made on the patient's scalp; the dura was pierced with a puncture needle and the F12 silicone ventricular drainage tube was inserted in the hematoma center, and connected to an extracorporeal drainage tube with a general suction volume of 20%-30%. Additionally, 50000 U of urokinase was injected into the hematoma cavity every day after completion, closed the tube, and opened the drainage two hours later for 3-7 d until 80%-90% of the hematoma was removed, drew out the tube.

In the observation group, we performed neuroendoscopic minimally invasive surgery by making a 3-4 cm cut where the maximum level of hematoma volume was present after moderate local anesthesia drilled within the skull plate, 1-1.5 cm closest to the hematoma center, separated the local brain tissue with bipolar electrocoagulation after incising the dura, punctured using a trocar along the direction of CTidentified the hematoma and applied the tube and suction equipment to clean the hematoma with monitor guidance, used bipolar electrocoagulation for hemostasis at the bleeding source, reserved ectocoelic drainage tube of hematoma, utilized gelatin sponge to fill the drill, and sewed up the incisions after removing the trocar.

#### Indicators of observation and methods of detection

Cytokine levels; National Hospital Stroke Scale (NIHSS) score; variation of Barthel index between the two groups before and after surgery; indices, such as operation time, bleeding volume, and hematoma clearance rate; and rate of complication and prognosis within 6 mo after surgery of the two groups were compared. The NIHSS score has a total score of 42 ranging from 0 to 42; a score < 7 is classified as mild neurological impairment; a score of 7-15 signifies moderate defect; a score > 15 is classified as severe defect. The Barthel index has a total score of 100. The score is directly proportional to independence and inversely proportional to dependence. Prognosis within 6 mo was assessed by the Glasgow Coma Scale (GCS score), with class I being death, class II being vegetative state, class III and IV being severe and mild disability respectively, and class V being good recovery. Class IV-V have a good prognosis.

#### Statistical analysis

Data was analyzed using SPSS19.0. (IBM SPSS Statistics for Windows, version 19, IBM Corp., Armonk, NY, United States). Description of measuring index with mean ± SD, application of t test, count data with  $\chi^2$  test, there was Statistical significance was set at *P* < 0.05.

#### RESULTS

#### Comparison of general information between two groups

There was no significant difference in the between-group comparison of general information of sex, age, hemorrhage location, *etc.* between two groups (P > 0.05) (Table 1).



Table 1 Comparison of general information between two groups									
				II	Volume of	GCS score	Hemorrhage location		
Groups	n	Male/female	Age (yr)	Hypertension duration (yr)	hematoma (mL)	(point)	Basal ganglia	Thalamus	Lobe
Control group	59	33/26	57.63 ± 9.32	11.25 ± 2.05	51.85 ± 12.69	9.12 ± 2.32	43 (72.88)	9 (15.25)	7 (11.86)
Observation group	59	35/24	56.86 ± 11.04	11.31 ± 1.97	52.14 ± 12.17	$9.05 \pm 2.41$	41 (69.49)	10 (16.95)	8 (13.56)
$\chi^2/t$		0.139	0.409	0.162	0.127	0.161	0.167		
P value		0.709	0.683	0.872	0.899	0.873	0.920		

#### Comparison of surgical related indicators between two groups

The observation group had a longer operation time of  $105.26 \pm 28.35$  min than the control group, and a higher volume of intraoperative hemorrhage of 45.36 ± 10.17 mL than the control group. Hematoma clearance rates of the observation group at 48 h and 72 h postoperatively were  $88.58\% \pm 4.69\%$  and  $94.47\% \pm 4.02\%$  respectively, and higher than those of the control group (P < 0.05) (Table 2).

#### Comparison of cytokine level, NIHSS score and Barthel index score between the two groups

On postoperative day 14, serum P substances (SP) level increased in the two groups, whereastumor necrosis factor-α (TNF-α), interleukin (IL)-6, IL-10 Levels decreased compared to their preoperative values. The above-mentioned cytokines in the observation group were higher than in the control group (P < 0.05). Similarly, on postoperative day 14, the Barthel index scores of the two groups increased, and the NIHSS score decreased compared to the preoperative values (Table 3). The Barthel index score of the observation group was higher than that of the control group, and the NIHSS score was lower than that of the control group (P < 0.05) (Table 4).

#### Comparison of complication rate during the hospital stay between two groups

Table 5 shows that there was no significant difference in the complication rates between the two groups (P > 0.05).

#### Comparison of prognosis within 6 mo between the two groups

Table 6 shows that both groups had no occurrence of class 1 case; the observation group had a significantly better prognosis than the control group (P < 0.05).

#### DISCUSSION

Minimally invasive puncture hematoma drainage surgery is commonly used in clinical practice. The operation is simple and can be completed under local anesthesia, which is suitable for application in frail and older patients or patients with serious diseases [6]. The operation causes minor trauma to the patient, which is conducive to the recovery of the patient. Needle drainage advocates earlier reduction of the compressive effect of the hematoma and less brain damage<sup>[7]</sup>.

However, the hematoma clearance rate is low. Drainage of the hematoma requires time, and the nerve function damage caused by the hematoma compression cannot be completely relieved within a short time[8]. It was found that the operation time of the observation group was prolonged, and the intraoperative bleeding higher, but the hematoma clearance rate increased. Because neuroendoscopic surgery can treat accurate positioning of the hematoma, use the transparent outer tube to observe the distribution of the surrounding hematoma, so as to facilitate clinical observation as much as possible Limit hematoma removal[9].

Currently, neuroendoscopy is considered for the surgical treatment of hypertensive cerebral hemorrhage. The first indication is that the operation should be performed after 6 h of the episodeas much as possible, and the operation time should be delayed as much as possible for patients who have been taking aspirin for a prolonged duration; second, it is suitable for patients with a hematoma volume of 30-90 mL, and is especially suitable for a deep hematoma. This operation is not suitable forpatients



#### Wei JH et al. Neuroendoscopic minimally invasive surgery for hypertensive intracerebral hemorrhage

Table 2 Comparison of surgical related indicators between two groups (mean ± SD)									
Groups Cases Operation time (min) Volume of hemorrhage with introperative (mL) Hematoma clearance rate (%)									
				48 h after surgery	72 h after surgery				
Control group	59	$42.55 \pm 9.14$	22.36 ± 3.85	$72.56 \pm 7.02$	89.35 ± 5.61				
Observation group	59	$105.26 \pm 28.35$	45.36 ± 10.17	$88.58 \pm 4.69$	$94.47 \pm 4.02$				
t		16.171	16.246	14.575	5.698				
P value		0.000	0.000	0.000	0.000				

#### Table 3 Comparison of cell factors between two groups (mean ± SD)

		TNF-α (μg/L)		IL-6 (ng/L)		IL-10 (ng/L)		SP (pg/mL)	
Groups	Cases	Before surgery	14 d after surgery	Before surgery	14 d after surgery	Before surgery	14 d after surgery	Before surgery	14 d after surgery
Control group	59	65.38 ± 8.52	46.32 ± 4.11 <sup>a</sup>	$57.25 \pm 7.14$	$20.03 \pm 4.36^{a}$	$11.24 \pm 3.23$	3.85 ± 0.54 <sup>a</sup>	$13.55\pm4.05$	$21.14 \pm 4.58^{a}$
Observation group	59	$64.96 \pm 7.86$	$40.25 \pm 3.71^{a}$	58.02 ± 7.63	$14.88 \pm 3.14^{a}$	11.08 ± 3.39	$2.41 \pm 0.27^{a}$	13.61 ± 3.82	27.81 ± 4.21 <sup>a</sup>
t		0.278	8.421	0.566	7.362	0.262	18.321	0.083	8.236
P value		0.781	0.000	0.572	0.000	0.793	0.000	0.934	0.000

 $^{a}P$  < 0.05, compared between groups before surgery. TNF- $\alpha$ : Tumor necrosis factor- $\alpha$ ; IL: Interleukin; SP: Serum P substances.

Table 4 Comparison of National Hospital Stroke Scale score and Barthel index between two groups (mean ± SD point)								
Crowne	Casas	NIHSS score		Barthel index				
Groups	Cases	Before surgery	14 d after surgery	Before surgery	14 d after surgery			
Control group	59	$19.25 \pm 4.77$	$8.12 \pm 2.03^{a}$	$15.36 \pm 4.74$	54.15 ± 5.33 <sup>a</sup>			
Observation group	59	$18.98 \pm 5.02$	$6.98 \pm 1.24^{a}$	$15.42\pm5.02$	$66.05 \pm 6.17^{a}$			
t		0.299	3.681	0.067	11.211			
<i>P</i> value		0.765	0.000	0.947	0.000			

 $^{a}P$  < 0.05, compared between groups before surgery. NIHSS: National Hospital Stroke Scale.

Table 5 Comparison of incidence of complications in hospital between two groups, n (%)									
Groups Cases Intracranial infection Pulmonary infection Recurrent postoperative hemorrhage Tot									
Control group	59	3 (5.08)	2 (3.39)	2 (3.39)	7 (11.86)				
Observation group	59	1 (1.69)	1 (1.69)	1 (1.69)	3 (5.08)				
<i>x</i> <sup>2</sup>					1.748				
<i>P</i> value	<i>P</i> value 0.186								

with poor cardiopulmonary function or in those who cannot tolerate general anesthesia<sup>[10]</sup>.

After treatment, the observation group increased significantly compared with the control group, whereas TNF-a, IL-6, IL-10 decreased significantly in the observation group. Thus, neuroendoscopic minimally invasive surgery for the treatment of hypertensive cerebral hemorrhage can significantly reduce the degree of inflammation in patients. On between group comparison, on postoperative day 14, the quality of life of patients improved significantly after neuroendoscopic minimally invasive surgery and the patients recovered. The effect of neurological deficit is more obvious. The



Baishidena® WJCC | https://www.wjgnet.com

Table 6 Comparison of prognosis within 6 mo between two groups, n (%)									
Groups	Cases	Class V	Class IV	Class III	Class II	Good prognosis rate			
Control group	59	9 (15.25)	33 (55.93)	12 (20.34)	5 (8.47)	42 (71.19)			
Observation group	59	16 (27.12)	35 (59.32)	6 (10.17)	2 (3.39)	51 (86.44)			
<i>x</i> <sup>2</sup>						4.111			
<i>P</i> value	P value 0.043								

prognosis is better. Secondary brain damage caused by hematoma can cause serious damage to patients.

On the one hand, thrombin in the hematoma can cause inflammation in the body, affecting endothelial cells, neurons and glial cells and resulting in damage to the blood-brain barrier[11]; on the other hand, white blood cells and microglia in the body are activated after cerebral hemorrhage, producing a large number of inflammatory factors, and further destroying the blood-brain barrier; thus, there is a vicious cycle created, further aggravating brain tissuedamage[12]. The endoscopic surgery produces less trauma, and the operation with the cannula does not damage the brain tissue, and the bleeding is arrested under electrocoagulation resulting inhemostasis in the hematoma cavity[13]. Reducing the occurrence of postoperative bleeding and early and rapid removal of the hematoma is beneficial to patients in order for them to begin rehabilitation.

During the treatment, we summarized the following experiences: First, the incision should be mainly arc-shaped, and designed outside the bone window. At the same time, it is necessary to restore the bone flapto avoid a high tension of the incision and poor healing. Second, the outer sleeve should be inserted as much as possible once. Once the bottom of the hematoma cavity is reached, close attention should be paid to the removal of the hematoma. Third, due to the large number of accessories required for neuroendoscopy devices, strict attention should be paid to the implementation of aseptic procedures to reduce the chance of intracranial infection<sup>[14]</sup>. The disadvantage of endoscopic surgery is that the operating space is small, and the technical requirements are high, especially when active bleeding occurs. Lens contamination caused by the active bleeding can cause the doctor's vision to be blurred. Hemostasis is relatively difficult, suggesting that preoperative evaluation should be done, and craniotomy planning should be performed, if necessary[15].

This study analyzed the advantages and disadvantages of the two surgical methods used in the surgical management of hypertensive intracerebral hemorrhage and selected an appropriate surgical treatment, for clinical reasons. The treatment plan provides a certain basis, but the number of patients enrolled in this study was small, and some of the included evaluation indicators have certain main factors. View ability may lead to bias in the results, and it is necessary to expand the sample size and formulate more reliable evaluation indicators for further demonstration[16-20].

#### CONCLUSION

In conclusion, neuroendoscopic minimally invasive surgery is more complicated than hard-channel minimally invasive puncture drainage in the treatment of hypertensive intracerebral hemorrhage, but has a more thorough hematoma clearance rate and a better short-term effect and long-term prognosis.

#### ARTICLE HIGHLIGHTS

#### Research background

Surgical treatment is a common method for hypertensive cerebral hemorrhage. The traditional craniotomy has a large skull window and good effect on removing edema, which is helpful for patients to pass through the peak period of brain edema. However, patients with this operation should be carried out under general anesthesia, and the wound caused by this operation is large. Therefore, most patients need blood transfusion. Some patients may have stronger edema reaction after surgical treatment, which is not conducive to postoperative recovery of patients.



#### Research motivation

Explore the application value of neuroendoscopic minimally invasive surgery in the treatment of hypertensive intracerebral hemorrhage.

#### Research objectives

The advantages and disadvantages of hard channel minimally invasive puncture drainage and neuroendoscopic minimally invasive surgery in hypertensive intracerebral hemorrhage were analyzed, which provided a basis for clinical rational selection of surgical treatment.

#### Research methods

A total of 118 patients with hypertensive cerebral hemorrhage were reviewed. The control group was treated with hard-channel minimally invasive puncture and drainage, and the observation group was treated with endoscopic minimally invasive surgery. The changes of serum P substances, inflammatory factors, National Hospital Stroke Scale (NIHSS) score and Barthel index were recorded, and the surgical related indexes and prognosis of the two groups were compared.

#### **Research results**

The operation time and intraoperative blood loss in the observation group were longer than those in the control group, with no advantages. Hematoma clearance rate and good prognosis rate at 48 h and 72 h after operation were higher than those in control group (P < 0.05); Complication rates in both groups not statistically significant (P > 0.05); 0.05) The inflammatory cytokines, NIHSS score and Barthel index in the postoperative 14 d, observation groups were better than in the control group (P < 0.05).

#### Research conclusions

Neuroendoscopic minimally invasive surgery for hypertensive intracerebral hemorrhage is relatively complex, but hematoma removal is more complete and the effect is better.

#### Research perspectives

Minimally invasive neuroendoscopic surgery can be more widely used in the treatment of hypertensive cerebral hemorrhage.

#### REFERENCES

- Kaneko M, Tanaka K, Shimada T, Sato K, Uemura K. Long-term evaluation of ultra-early operation 1 for hypertensive intracerebral hemorrhage in 100 cases. J Neurosurg 1983; 58: 838-842 [PMID: 6854376 DOI: 10.3171/jns.1983.58.6.0838]
- 2 Hu S, Sheng W, Hu Y, Ma Q, Li B, Han R. A nomogram to predict early hematoma expansion of hypertensive cerebral hemorrhage. Medicine (Baltimore) 2021; 100: e24737 [PMID: 33607818 DOI: 10.1097/MD.00000000024737
- 3 Liu J, Cheng J, Zhou H, Deng C, Wang Z. Efficacy of minimally invasive surgery for the treatment of hypertensive intracerebral hemorrhage: A protocol of randomized controlled trial. Medicine (Baltimore) 2021; 100: e24213 [PMID: 33546039 DOI: 10.1097/MD.00000000024213]
- Zhao XH, Zhang SZ, Feng J, Li ZZ, Ma ZL. Efficacy of neuroendoscopic surgery vs craniotomy for supratentorial hypertensive intracerebral hemorrhage: A meta-analysis of randomized controlled trials. Brain Behav 2019; 9: e01471 [PMID: 31743631 DOI: 10.1002/brb3.1471]
- Sun S, Li Y, Zhang H, Gao H, Zhou X, Xu Y, Yan K, Wang X. Neuroendoscopic Surgery vs Craniotomy for Supratentorial Hypertensive Intracerebral Hemorrhage: A Systematic Review and Meta-Analysis. World Neurosurg 2020; 134: 477-488 [PMID: 31669683 DOI: 10.1016/j.wneu.2019.10.115
- 6 Tang Y, Yin F, Fu D, Gao X, Lv Z, Li X. Efficacy and safety of minimal invasive surgery treatment in hypertensive intracerebral hemorrhage: a systematic review and meta-analysis. BMC Neurol 2018; 18: 136 [PMID: 30176811 DOI: 10.1186/s12883-018-1138-9]
- Ye Z, Ai X, Hu X, Fang F, You C. Comparison of neuroendoscopic surgery and craniotomy for 7 supratentorial hypertensive intracerebral hemorrhage: A meta-analysis. Medicine (Baltimore) 2017; 96: e7876 [PMID: 28858100 DOI: 10.1097/MD.00000000007876]
- Xu X, Chen X, Li F, Zheng X, Wang Q, Sun G, Zhang J, Xu B. Effectiveness of endoscopic surgery 8 for supratentorial hypertensive intracerebral hemorrhage: a comparison with craniotomy. J Neurosurg 2018; 128: 553-559 [PMID: 28387618 DOI: 10.3171/2016.10.JNS161589]
- 9 Xia L, Han Q, Ni XY, Chen B, Yang X, Chen Q, Cheng GL, Liu CF. Different Techniques of Minimally Invasive Craniopuncture for the Treatment of Hypertensive Intracerebral Hemorrhage.



World Neurosurg 2019; 126: e888-e894 [PMID: 30872203 DOI: 10.1016/j.wneu.2019.03.006]

- 10 Luan L, Li M, Sui H, Li G, Pan W. Efficacies of minimally invasive puncture and small bone window craniotomy for hypertensive intracerebral hemorrhage, evaluation of motor-evoked potentials and comparison of postoperative rehemorrhage between the two methods. Exp Ther Med 2019; 17: 1256-1261 [PMID: 30680000 DOI: 10.3892/etm.2018.7094]
- 11 Shao X, Wang Q, Shen J, Liu J, Chen S, Jiang X. Comparative Study of Micro-Bone Window and Conventional Bone Window Microsurgery for Hypertensive Intracerebral Hemorrhage. J Craniofac Surg 2020; 31: 1030-1033 [PMID: 32118662 DOI: 10.1097/SCS.00000000006259]
- Luostarinen T, Satopää J, Skrifvars MB, Reinikainen M, Bendel S, Curtze S, Sibolt G, Martinez-12 Majander N, Raj R. Early surgery for superficial supratentorial spontaneous intracerebral hemorrhage: a Finnish Intensive Care Consortium study. Acta Neurochir (Wien) 2020; 162: 3153-3160 [PMID: 32601805 DOI: 10.1007/s00701-020-04470-y]
- 13 Mouchtouris N, Saiegh FA, Chalouhi N, Sweid A, Papai EJ, Wong D, Kim J, Saline A, Nauheim D, Gooch R, Tjoumakaris S, Rosenwasser R, Jabbour P. Low diagnostic yield in follow-up MR imaging in patients with spontaneous intracerebral hemorrhage with a negative initial MRI. Neuroradiology 2021; 63: 1009-1012 [PMID: 33226459 DOI: 10.1007/s00234-020-02570-1]
- Hostettler IC, Seiffge DJ, Werring DJ. Intracerebral hemorrhage: an update on diagnosis and treatment. Expert Rev Neurother 2019; 19: 679-694 [PMID: 31188036 DOI: 10.1080/14737175.2019.1623671
- Pallesen LP, Wagner J, Lambrou D, Braun S, Weise M, Prakapenia A, Barlinn J, Siepmann T, 15 Winzer S, Moustafa H, Kitzler HH, Barlinn K, Reichmann H, Puetz V. Association of Hypertensive Intracerebral Hemorrhage with Left Ventricular Hypertrophy on Transthoracic Echocardiography. J Clin Med 2020; 9 [PMID: 32650380 DOI: 10.3390/jcm9072148]
- Sorribes IC, Moore MNJ, Byrne HM, Jain HV. A Biomechanical Model of Tumor-Induced 16 Intracranial Pressure and Edema in Brain Tissue. Biophys J 2019; 116: 1560-1574 [PMID: 30979548 DOI: 10.1016/j.bpj.2019.02.030]
- 17 Sun G, Li X, Chen X, Zhang Y, Xu Z. Comparison of keyhole endoscopy and craniotomy for the treatment of patients with hypertensive cerebral hemorrhage. Medicine (Baltimore) 2019; 98: e14123 [PMID: 30633227 DOI: 10.1097/MD.00000000014123]
- Suresh MP, Munoz-Bendix C, Felsberg J, Steiger HJ, Hänggi D, Beseoglu K, Beez T. Calcifying 18 Pseudoneoplasm of Neuraxis (CAPNON) in the Posterior Third Ventricle-Challenge for Neuroendoscopy. World Neurosurg 2020; 138: 481-484 [PMID: 32135316 DOI: 10.1016/j.wneu.2020.02.126]
- Marklund N. Neuroendoscopy-a minimally invasive alternative in the surgical management of 19 traumatic intracerebral contusions? Acta Neurochir (Wien) 2019; 161: 231-232 [PMID: 30666452 DOI: 10.1007/s00701-019-03813-8]
- Lim A, Schonewille A, Forbrigger C, Looi T, Drake J, Diller E. Design and Comparison of 20 Magnetically-Actuated Dexterous Forceps Instruments for Neuroendoscopy. IEEE Trans Biomed Eng 2021; 68: 846-856 [PMID: 32746054 DOI: 10.1109/TBME.2020.3007581]





# Published by Baishideng Publishing Group Inc 7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA Telephone: +1-925-3991568 E-mail: bpgoffice@wjgnet.com Help Desk: https://www.f6publishing.com/helpdesk https://www.wjgnet.com

