

Original Research Article

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Management of spontaneous intra parenchymal hematomas: a cohort study

Girish K. Madhavan, Philip Issac*, Balakrishnan P. Kunjan, Ajax John, Tom Jose

Department of Neurosurgery, GMC, Kottayam, Kerala, India

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***Correspondence:**

Dr. Philip Issac,

E-mail: philipkissac@gmail.com

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ABSTRACT

Background: Management of intra parenchymal hematoma is a dilemma for neuroscientists, still a life-threatening entity which needs multidisciplinary approach. 13% of all strokes constitutes hemorrhagic. Mortality and morbidity of patients depends on the status of initial presentation. Prognosis of the surgeries may vary from person to person and according to the comorbidities. The aim of the study was to determine effectiveness of decompressive craniectomy (DC) with hematoma evacuation in reducing the mortality.

Methods: Patients with spontaneous intra parenchymal hematomas were selected and those having herniation syndrome were considered for surgery. Patients were evaluated after 30 days and 6 months and mortality was calculated.

Results: 126 patients were selected for surgery, in that 102 patients underwent DC with hematoma evacuation and 24 patients who were not willing for surgery were considered as control group. Mortality of patients at 30 days of surgical group was 19.6% and 58.3% respectively, while 6 months mortality was 31.3% and 70.8% for surgical and control group.

Conclusions: Surgical intervention can effectively reduce the mortality in spontaneous intra parenchymal hematomas.

Keywords: Decompressive craniectomy, Intraparenchymal hemotoma, Hematoma evacuation

INTRODUCTION

Decompressive craniectomy (DC) is considered as a satisfactory treatment modality in space occupying lesions, acute subdural hematomas, ischemic stroke, cavernous sinus venous thrombosis.^{3,4} Management of hypertensive intra parenchymal includes both conservative and surgical.

Certain predictors are mentioned in the researches which can affect the prognosis of the patient. According to the initial presentation, medical co morbidities, age and size of hematomas, the management is planned.^{6,7} DC with hematoma evacuation is done in many centres as an emergency treatment for ICH. Many grading systems are

also developed to prognosticate from the presentation. The aim of the study was to evaluate the feasibility of DC with hematoma evacuation for spontaneous intra parenchymal hematoma (ICH).

METHODS

This prospective study was conducted at Govt. medical college Kottayam from August 2019 to January 2021. This includes all the patients diagnosed of spontaneous intra parenchymal haemorrhage presented in casualty in age limit from 12 years to 75 years with no history of trauma. A total 420 patients of spontaneous ICH were presented to hospital were studied. Initial presentations, presenting GCS score, pathology, size of hematoma and ICH-GS

score was calculated and considered surgical evacuation for patients with herniation syndrome.

One hundred and twenty-six patients were selected for surgical evacuation according to the signs and symptoms of raised intracranial pressure and brain herniation. Those patients who were not willing for surgical evacuation were considered control group. And those patients who lost follow up were excluded from the study.

Surgical evacuation of hematoma with decompressive craniectomy was done to all patients and monitored in intensive care unit. A detailed performa was collected for all patients. Mortalities were evaluated and follow up done after 1 month and 6 months.

The ethical clearance for this study was attained from institutional review board, GMC Kottayam, 31/2020. Convenient sampling was done in this study as few Indian studies were done in this context. Data assessment was done using SPSS software and Microsoft excel.

Descriptive statistics were ascertained for the included studies. Means standard deviations and proportions were calculated for all outcomes of interest

RESULTS

One twenty-six patients presented to this institution with spontaneous intraparenchymal hematomas with symptoms of raised intra cranial tension were included in this study. Of these patients 102 patients were managed with DC with hematoma evacuation and 24 patients who were not willing for surgery were considered as control group. 30 days mortality of surgical group was 19.6%, and for control group was 58.3%, while 6 months mortality of surgical group was 31.3%, and that of control group was 70.8% (Table 1). Mortality of post-operative patients with supra-tentorial bleeding in 6 months was about 27.2 percentage while 57 percent for infra-tentorial bleeding died in six months. Sixty three percent of patients with hematoma size more than 70 ml died in 6 months. 62 percent of patients with IVH died in 6 months (Table 2).

Table 1: Mortality of patients.

Duration of mortality	Surgery group (n=102) N (%)	Conservative group (n=24) N (%)
30 days	20 (19.6)	14 (58.3)
6 months	32 (31.3)	17 (70.8)

Table 2: Distribution of patients in group A.

Variables	No. of cases	30 days mortality	6 months mortality (%)
Location	Supra-tentorial	14	24 (27.2)
	Infratentorial	6	8 (57.1)
Size of hematoma (ml)	40-70	10	18(22.5)
	>70	10	14 (63.6)
Age (years)	<45	2	3 (20)
	45-65	10	15 (28.3)
	>65	8	14 (41.17)
IVH	Absent	2	10 (12.9)
	Present	18	22 (62.8)
GCS score	3-8	14	18 (40.9)
	9-12	6	10 (21.7)
	>12	0	2 (16.67)

DISCUSSION

Management of spontaneous intra-cerebral hematoma include identification of pathology, timely intervention, ICU care, post-operative care, physiotherapy and treatment of the pathology.^{8,9} Many studies were published regarding the efficacy of surgical management for ICH.

On comparing the mortality with recent studies where only medical management were done, 30 days mortality ranges

from 23.3% to 50% and after surgery mortality ranges from 31 to 40%.^{10,11} In our study, 30 days mortality was 19.6%, while 6 months mortality among surgical group is 31.3%. On comparing with other studies, Bhatia et al studied 212 cases and managed conservatively. Their 30 days mortality was 33.9%. Fogelholm et al also managed 411 cases conservatively with a 30 days mortality of 50 percent. In Flaherty et al they compared both surgical and medical management and got similar results with a little higher mortality for medically managed patients (Table 3).

Table 3: Comparison of recent studies.

Studies	Management	No. of cases	30 days mortality (%)	6 months mortality (%)
This study	Medical	24	14 (58.3)	17 (70.8)
	Surgical	102	20 (19.6)	32 (31.3)
Bhatia et al¹²	Medical management	212	70 (33.9)	-

Continued.

Studies	Management	No. of cases	30 days mortality (%)	6 months mortality (%)
Fogelholm et al ¹³	Surgical management	Nil	-	-
	Medical management	411	(50)	-
	Surgical management	Nil	-	-
Douglas et al ¹⁴	Medical management	70	28 (40)	40 (57)
	Surgical management	Nil	-	-
Flaherty et al ¹⁵	Medical management	1041	34	(59)
	Surgical management	183	31	(53)

In this study, surgically managed patients have considerably less mortality compared to medically managed patients. But there observed only 10 to 12% increase in mortality in both groups after 6 months. This indicates the surgical management have more effect on 30 days mortality rather than 6 months mortality.

Limitations

The sample size was not adequate to conclude the effectiveness of DC for spontaneous ICH. The different surgeons performing this study and their skill in evacuation of hematoma also add to the outcome. The post-operative care given at the home also varies according to the financial status and that will account in the final outcome.

CONCLUSION

Surgical management can reduce the 30 days mortality of spontaneous intra parenchymal hematoma significantly. So, if the patient is presenting with signs of brain herniation or raised Intra cranial pressure, surgical DC is recommended.

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REFERENCES

1. Vahedi K, Hofmeijer J, Juettler E, Vicaut E, George B, Algra A, et al. Early decompressive surgery in malignant infarction of the middle cerebral artery: a pooled analysis of three randomised controlled trials. *Lancet Neurol.* 2007;6(3):215-22.
2. Weiner GM, Lacey MR, Mackenzie L, Shah DP, Frangos SG, Grady MS, et al. Decompressive craniectomy for elevated intracranial pressure and its effect on the cumulative ischemic burden and therapeutic intensity levels after severe traumatic brain injury. *Neurosurgery.* 2010;66(6):1111-8.
3. Nagel A, Graetz D, Vajkoczy P, Sarrafzadeh AS. Decompressive craniectomy in aneurysmal subarachnoid hemorrhage: relation to cerebral perfusion pressure and metabolism. *Neurocrit Care.* 2009;11(3):384-94.
4. Ferro JM, Crassard I, Coutinho JM, Canhao P, Barinagarrementeria F, Cucchiara B, Derex L, et al. Decompressive surgery in cerebrovenous thrombosis: a multicenter registry and a systematic review of individual patient data. *Stroke.* 2011;42(10):2825-31.
5. Ma L, Liu WG, Sheng HS, Fan J, Hu WW, Chen JS. Decompressive craniectomy in addition to hematoma evacuation improves mortality of patients with spontaneous basal ganglia hemorrhage. *J Stroke Cerebrovasc Dis.* 2010;19(4):294-8.
6. Shimamura N, Munakata A, Naraoka M, Nakano T, Ohkuma H. Decompressive hemi-craniectomy is not necessary to rescue supratentorial hypertensive intracerebral hemorrhage patients: consecutive single-center experience. *Acta Neurochir Suppl.* 2011;111:415-9.
7. Dierssen G, Carda R, Coca JM. The influence of large decompressive craniectomy on the outcome of surgical treatment in spontaneous intracerebral haematomas. *Acta Neurochir.* 1983;69(1):53-60.
8. Murthy JM, Chowdary GV, Murthy TV, Bhasha PS, Naryanan TJ. Decompressive craniectomy with clot evacuation in large hemispheric hypertensive intracerebral hemorrhage. *Neurocrit Care.* 2005;2(3):258-62.
9. Kim KT, Park JK, Kang SG, Cho KS, Yoo DS, Jang DK, et al. Comparison of the effect of decompressive craniectomy on different neurosurgical diseases. *Acta Neurochir.* 2009;151(1):21-30.
10. Ramnarayan R, Anto D, Anilkumar TV, Nayar R. Decompressive hemicraniectomy in large putaminal hematomas: an Indian experience. *J Stroke Cerebrovasc Dis.* 2009;18(1):1-10.
11. Broderick JP. The STICH trial: what does it tell us and where do we go from here?. *Stroke.* 2005;36(7):1619-20.
12. Bhatia R, Singh H, Singh S, Padma MV, Prasad K, Tripathi M, et al. A prospective study of in-hospital mortality and discharge outcome in spontaneous intracerebral hemorrhage. *Neurol India.* 2013;61(3):244-8.
13. Fogelholm R, Murros K, Rissanen A, Avikainen S. Long term survival after primary intracerebral haemorrhage: a retrospective population based study. *J Neurol Neurosurg Psychiatry.* 2005;76(11):1534-8.

14. Douglas MA, Haerer AF. Long-term prognosis of hypertensive intracerebral hemorrhage. *Stroke.* 1982;13(4):488-91.
15. Flaherty ML, Beck J. Surgery for intracerebral hemorrhage: moving forward or making circles? *Stroke.* 2013;44(10):2953-4.

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