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Spontaneous Cerebellar Hematoma: Review of 20 Cases

Ayad Y Abdulnabi *FICMS*, **Haider K Radhee** *FICMS*, **Basim S Abd-Ali** *FICMS*

Dept. Neurosurgery, Al-Shaheed Ghazi Al-Hariri Hospital, Medical City, Baghdad, Iraq

Abstract

Background Haemorrhages into structure of the posterior fossa pose unique risks due to limited space in this compartment and risk of hydrocephalus from compression of fourth ventricle. Most are neurosurgical emergencies requiring close monitoring and/or immediate evacuation.

Objectives To analyze therapy results obtained for surgically and conservatively treated patients. As well as to find prognostic parameters that can predict patient's outcome.

Method Retrospective study conducted at the Neurosurgical Hospital in Baghdad, and Al-Shaheed Ghazi Al-Hariri for Surgical Specialties Hospital. All the information were collected from hospital records between December 2000 and December 2002 for 20 patients with spontaneous cerebellar hematoma and included Clinical data like the onset of symptoms and signs, durations, progression of clinical condition, past medical history. Records of vital signs and neurological signs. Records of laboratory studies include complete blood picture, blood grouping, blood biochemistry, prothrombin time, partial thromboplastin time, bleeding and clotting time). Records of CT-scan analyzed according to the site, size, and presence of associated pathology. Size of the hematoma estimated by the maximum axial diameter.

Results Age of patients in this study ranged from 6-76 Years .There was 12(60%) male and 8(40%) female patients with male to female ratio 1.5:1. Mortality in the conservatively treated group is 33%, while it is 54% in the surgically treated group. Hydrocephalus was present in 100% of patients in the surgical group, while it is not present in the conservatively treated patients.

Conclusions The most important prognostic factors were GCS score on admission, interval between hemorrhage onset and treatment, size and site of hematoma, presence of hydrocephalus, and fourth ventricular extension. Suboccipital craniectomy to evacuate the hematoma is the most effective procedure where surgical treatment is indicated.

Keywords Cerebellar hematoma, suboccipital craniectomy, ventriculostomy.

Introduction

The cerebellum occupies the posterior fossa, where it lies posterior to the brain stem. It consists of two hemispheres united in the midline by a portion of cerebellar substance known as the vermis [1]. Cerebellar hemorrhages account for about 10% of ICH [2,3]. Most of them attributable to hypertension, although vascular malformation and coagulopathy are also important cause [4]. The clot usually originates in the region of dentate nucleus, an area supplied by branches of the superior and anterior inferior cerebellar arteries [2,3]. They are usually confined to a single hemisphere, but they may extend into the 4th ventricle. Cerebellar hemorrhage is usually classified into mild and severe, depending on the size of the hematoma. The mild type is less than 3cm in diameter and the severe type 3cm or more [5].

CT scan: The initial radiologic study to be requested in the workup is unenhanced CT-scan [2]. The clot can be well visualized [6]. The CT scan

may also provide additional valuable anatomical information, such as size, site, blood in the 4th ventricle, brain stem distortion, obstructive hydrocephalus, calcification of vascular lesion [2, 4]. CT scan may reveal structural abnormality like tumor, AVM [2,4,7,8]. CT infusion scanning can confirm the presence or absence of an aneurysm within short period of time [11]. CT scan may reveal structural abnormality like tumor, AVM [4,7,9-11]. CT infusion scanning can confirm the presence or absence of an aneurysm within short period of time [4,12,13]. MRI provides superior resolution during the subacute and chronic stages can identify the underlying associated pathologies. MRI is superior to CT scan and angiography in detecting cavernous angiomas [7]. Angiography may be employed if an AVM or other specified lesion is suspected, particularly in a young patient without history of hypertension [9]. It confirms the diagnosis of lesions such as tumor, aneurysm, or AVM [4,14,15]. The aims of the study are to assess therapeutic approaches and outcome for surgically and conservatively treated patients and to find prognostic parameters that can predict patient's outcome.

Method

This is a retrospective study conducted at the Neurosurgical Hospital in Baghdad, and Al-Shaheed Ghazi Al-Hariri for Surgical Specialties Hospital between December 2000 and December 2002 on 20 patients with spontaneous cerebellar hematoma. All the information was collected from hospital records and follow up during period of hospitalization. Clinical data collected include records the onset of symptoms and signs, durations, progression of clinical condition, past medical diseases, especially systemic hypertension, drug history as past history of anticoagulant taking. Records of systemic examinations including vital signs, neurological examinations. Laboratory studies include complete blood picture, blood grouping, blood biochemistry prothrombin time (PT) partial thromboplastin time (PTT), bleeding and clotting time. Radiological evaluation included CT scan as early as possible for all patients. Size of the hematoma was estimated by the maximum axial diameter. Magnetic resonance imaging (MRI) and MRA were done for patients. Digital subtraction angiography was done for Patients. Medical treatment for all patients, therapy includes control of blood pressure, intravenous fluids, early nutritional support, Dexamethazon 4 mg 4 times daily, H2 blockers. 9(45%) patients treated conservatively and 11(55%) patients treated surgically in form of suboccipital craniectomy and evacuation of the hematomas in 7 (35%) patients or external ventricular drain in 4 (20%) patients. Indications of surgery depended on large size hematoma (≥3 cm in maximal axial diameter), altered level of consciousness, and presence of hydrocephalus.

Results

Age and gender

Total number of patients enrolled in the study was 20. Age of patients in this study ranged from 6-76 Years (mean±SD = 55± 18years). There was 12(60%) male and 8(40%) female patients with male to female ratio 1.5:1 (Figure 1).

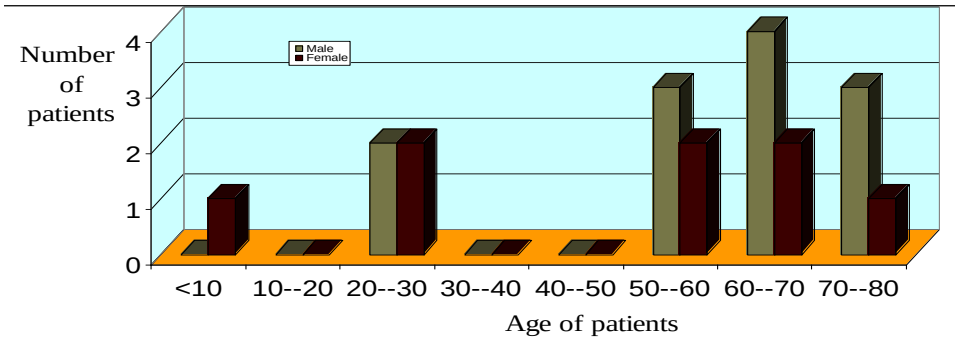

Figure 1. Age and gender distribution

Regarding the Interval between hemorrhage onset and treatment, only 2(10%) patients have been managed in the first 6 hours, 8(40%) patients treated 6-24 hours, 10(50%) patients treated after 24 hours (Figure 2).

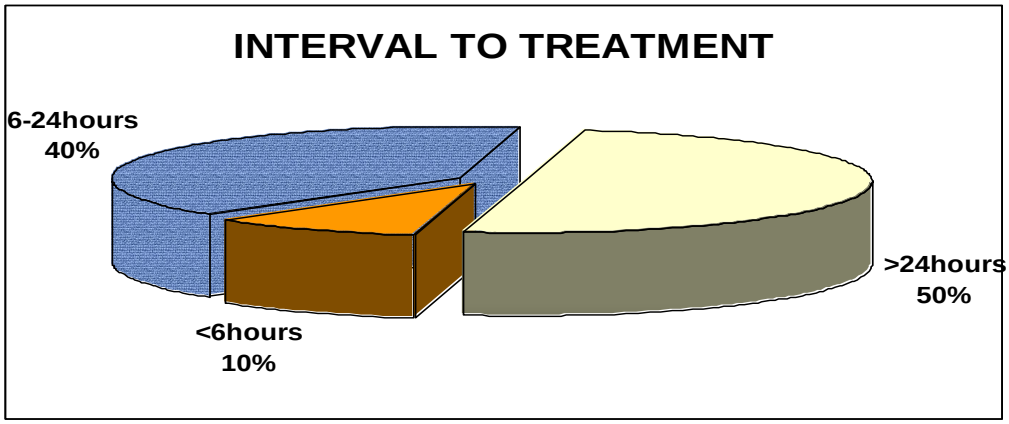

Figure 2. Interval between hemorrhage onset and treatment

Table 1 showed that patients with G.C.S. score ≤ 7.7 (100%) patients died while all patients with G.C.S. score ≥ 12 survived. Mortality in patients with hematoma size ≥ 3 cm in diameter was 9 (75%), while all patients with hematoma size < 3 cm in diameter survived.

Table 1. Mortality according to the size of hematoma and G.C.S

Hematoma size		<7	8-11	12-13	≥14	All grades
Hematoma <3cm	No. of patients	0	2	1	5	8
	No. of deaths	0	0	0	0	0
Hematoma ≥3cm	No. of patients	7	4	1	0	12
	No. of deaths	7	2	0	0	9
	%	100%	50%	0%	0%	75%
Total	No. of patients	7	6	2	5	20
	No. of deaths	7	2	0	0	9
	%	100%	33%	0%	0%	45%

Table 2 displays the main differences in between both treatment groups:

1- Mean size of clot in maximum axial diameter in conservative and surgical group were 2.8 cm and 3.6 cm respectively.
2- Hydrocephalus was present in 100% of patients in the surgical group, while it is not present in the conservatively treated patients.
3- 67% of patients in the conservatively treated group had G.C.S ≥ 12, while none of the patients in the surgically treated group had G.C.S ≥ 12.
4- Mortality in the conservatively treated group is 33%, while it is 54% in the surgically treated group.

Table 2. Comparison between treatment groups

Conservative		Surgical		Character	
No. of patients		11	55%	9	45%
Mean age (years) ±SD		58.3±(16.1)		56.1±(21.2)	
Pre-existing hypertension (no.) (%)		8	73%	7	78%
Site of hematoma	Hemispheric	8	73%	8	89%
	Vermian	3	27%	1	11%
Mean diameter of clot (cm)		3.6		2.8	
Size ≥3 cm		10	90%	2	22%
GCS≥12		0	0%	6	67%
Presence of hydrocephalus		11	100%	0	0%
4th ventricular extension		2	18%	2	22%
Survivors		5	45%	6	67%
Dead		6	54%	3	33%

The highest mortality was among the patients who underwent ventriculostomy (75%). The mortality in patients treated with suboccipital craniectomy was (43%). The least mortality was among the medically treated group (Table 3).

Table 3. Mortality according to treatment

Treatment	Total No. of patients	Deaths (no.)	Survivors (no.)	Mortality (%)
Medical	9	3	6	33%
Suboccipital craniectomy	7	3	4	43%
Ventriculostomy	4	3	1	75%

Discussion

In this study ages of patients ranged from 6-76 years, exhibiting peak incidence between 50-70 years of age. There were 60% males and 40% females patients with male to female ratio 1.5:1. Kaufman reported that the highest frequency of spontaneous cerebellar hematoma is in the sixth through eighth decades of life and these occur more commonly in males [(4)]. Hematoma size considered as an important prognostic factor because patients with hematoma size ≥3cm have 75% mortality while none of the patients with hematoma size < 3 cm had died (Table 1). Lois et al considered hematoma size > 3 cm as a radiologic predictor for poor outcome [(16)]. Rial and Uno also reported that the degree of consciousness disturbance, hematoma size ≥ 3 cm, hydrocephalus, age, and intraventricular extension are predictors of prognosis [(9,10)]. In this study only 10% of all patients have been treated in the first 6 hours, 40% treated within 6-24 hours, and 50% treated after 24 hours. There was delay in the treatment because many patients were referred from distant areas, and from other hospitals, and also because of the time needed to complete the diagnostic investigations of patients.

In this study we found mortality rate for patients treated by suboccipital craniectomy and external ventricular drain were 43%, 75% respectively (Table 3). Kanno et al reported that suboccipital craniectomy to evacuate the hematoma is the most effective procedure where surgical treatment is indicated [(5)]. The main differences between the two groups were in; the maximal axial diameter of clot, the presence of hydrocephalus, level of consciousness (Table 2). These differences noticed because in our study we regard the above features as factors that indicate surgical treatment.

We conclude that the age and preexisting hypertension were the major risk factor, the important prognostic factors were GCS score on admission, hematoma size and location, presence of hydrocephalus, and intraventricular extension and suboccipital craniectomy to evacuate the hematoma is the most effective procedure where surgical treatment is indicated.

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Correspondence to Ayad Y Abdulnabi
E-mail: ayadyousif2005@hotmail.com
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