Age-adjusted analysis of 697 patients with chronic subdural hematoma – Clinical presentation and postoperative outcome

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Introduction

In aging populations, the prevalence of dementia syndromes increases significantly. One cause of mental deterioration and cognitive decline in the elderly is chronic subdural hematoma (CSH), a condition that is generally treated surgically (1). However, little information is available on the differences in neurological presentation and restoration of functional integrity according to patient age (2). To evaluate age-related clinical courses after the surgical removal of CSH, we analyzed all patients with CSH who had been treated in our department over the past 22 years.

Methods

We retrospectively reviewed our database and identified all patients with CSH who had been treated surgically in our Department of Neurosurgery between 1992 and 2013. Exclusion criteria were acute subdural hematoma, hygroma or CSH in patients with shunt catheters.
Patient files were analyzed for demographical data (age, gender), the localization, side and thickness of the CSH, the type and number of surgical procedures, the history of previous trauma, anticoagulant treatment, procedure-related complications, inhospital mortality, and days of hospitalization. Clinical presentation on admission and discharge were evaluated: headache, speech disturbances, motor deficits, organic brain syndrome (aggressive or inadequate behavior), mnestic deficits (cognitive decline or confusion), and seizures. The population was dichotomized in four age groups (AG): 1) <65 years, 2) 66 to 75 years, 3) 76 to 85 years, 4) >86 years.
Analysis of variance (ANOVA) was done by the Kruskal-Wallis One Way Analysis of Variance on Ranks. Subgroups were compared with the Mann-Whitney Rank Sum Test. The confidence interval was defined as 95%, the significance level was $p<0.05$.

The study was approved by the Ethics Committee of the University Regensburg.

Results

96.5% (n=673) of the patients were treated by burrhole trephination and subdural drainage. The mean thickness of the hematomas was 2.1 cm. Surgery-related morbidity was 4.9% (n=34) and inhospital mortality 1.1% (n=8). Neurological deficits on admission and consecutive improvement rates for the entire population are shown in Table 1. AG 1 and AG 2 consisted of 208 patients each, AG 3 of 196 patients, and AG 4 of 85 patients. No significant differences were found between the age groups with regard to the complication rates,

Characteristic	pre-OP	post-OP	
Mnestic deficits	315 (45.2%)	86 (12.3%)	p<0.001
Headache	301 (43.2%)	38 (5.5%)	p<0.001
Paresis	287 (41.2%)	74 (10.6%)	p<0.001
Organic brain syndrome	151 (21.7%)	74 (10.6%)	p<0.001
Aphasia	135 (19.4%)	33 (4.7%)	p<0.001
Seizures	39 (5.6%)	20 (2.9%)	p=0.012

Table 1. Neurological deficits, entire population

but patients older than 75 years more frequently required reoperation (p=0.001). The most common preoperative symptoms were headache in AG 1 and AG 2 (56.3% and 48.5%) and cognitive decline in AGs 3 and AG 4 (54.9%, 51.9%). The most common clinical residuals were motor deficits in AG 1 (10.4%), mnestic deficits in AG 2 (10.7%) and AG 4 (24.1%), and organic brain syndrome in AG 3 (15.0%). Neurological deficits according to AG and the consecutive improvement rates are summarized in Table 2.

	< 65	66-75	76-85	86-95	>95	Gesamt
n	208	208	196	83	2	697
m : w	156 / 52	145 / 63	116 / 80	43 / 40	1/ 1	461/236
Mnestic deficit pre	77 / 202 (38.1%)	90 / 206 (43.7%)	106 / 193 (**54.9%**)	41/ 79 (**51.9%**)	1 / 2 (50%)	315/682 (46.2%)
Mnest deficit post	17 / 201 (8.5%)	22 / 206 (**10.7%**)	28 / 192 (14.6%)	19 / 79 (**24.1%**)	0 /2 (0%)	86/680 (12.6%)
Headache pre	112 / 199 (**56.3%**)	98 / 202 (**48.5%**)	64 / 185 (34.6%)	26 / 78 (33.3%)	1 / 2 (50%)	301/666 (45.2%)
Headache post	14 / 201 (7.0%)	13/ 206 (6.3%)	9 / 189 (4.8%)	2 / 79 (2.5%)	0 / 2 (0%)	38/677 (5.6%)
Paresis pre	63 / 204 (30.9%)	92 / 208 (44.2%)	91 / 194 (46.9%)	41 / 81 (50.6%)	0 / 2 (0%)	287/689 (41.7%)
Paresis post	21 / 202 (**10.4%**)	21 / 207 (10.1%)	23 / 192 (12.0%)	9 / 79 (11.4%)	0 / 2 (0%)	74/682 (10.9%)
Aphasia pre	22 / 150 (14.7%)	42 / 147 (27.8%)	50 / 145 (34.5%)	21 / 55 (38.2%)	0 / 2 (0%)	135/499 (27.1%)
Aphasia post	9 / 153 (5.9%)	9 / 148 (6.1%)	10/146 (6.9%)	5 / 55 (9.1%)	0 /1 (0%)	33/503 (6.6%)
Organic brain syndrome pre	31 / 204 (15.2%)	35 / 208 (16.8%)	50 / 196 (25.5%)	34 / 83 (40.9%)	1 / 2 (50%)	151/693 (21.8%)
Organic brain syndrome post	14 / 202 (6.9%)	17 / 207 (8.2%)	29 / 193 (**15.0%**)	13 / 80 (16.3%)	1 / 2 (50%)	74/684 (10.8%)
Seizure pre	18 / 205 (8.8%)	8 / 208 (3.8%)	7 / 195 (3.6%)	6 / 83 (7.2%)	0 / 2 (0%)	39/693 (5.6%)
Seizure post	7 / 204 (3.4%)	2 / 207 (0.9%)	11 / 193 (5.7%)	0 / 81 (0%)	0 / 2 (0%)	20/687 (2.9%)

Table 2. Neurological deficits, subgroup analysis based on AG

Conclusions

Symptomatic patients benefit from surgical evacuation of a space-occupying CSH, irrespectively of age. Surgical mortality and morbidity are low.
As described before, common CSH-related neurological deficits such as headache or cognitive decline are rather unspecific (3,4). However, our analysis showed a significant relationship between age and symptomatology as well as age-dependent improvement of neurological deficits after surgical removal of CSH.
These findings may further improve assessment and age-adjusted classification of patients with CSH.

Learning Objectives

Age-dependent functional imrovement in chronic subdural hematomas

References

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