Surgical Management Of Intracerebral Hemorrhage

NURCAN ÖZDAMAR, TAYFUN DALBASTI

E.Ü.T.F. Department of Neurosurgery, 35100 Bornova, İzmir - Türkiye

Abstract : Management of spontaneous intracerebral haemorrhage is one of those fields where the discussion is still on. Questions of to operate or not to operate, timing and type of surgery does not have clear answers yet. Open craniotomy, burr–hole draining with or without thrombolytic agent administration are current methods of choice for surgery. The surgical outcome of 151 cases of spontaneous intracerebral haemorrhage are discussed and the initial neurological grade, timing and type of surgery and outcome are evaluated. It is concluded that timing of surgery and neurological grading are important factors for outcome together with satisfactory surgery.

Key Words : spontaneous intracerebral haemorrhage, surgical management

INTRODUCTION

Spontaneous intracerebral haemorrhage occurs primarily as a complication of hypertension and secondly due to various bleeding disorders such as angiomas and some kinds of tumours. It is one of the most variable brain disturbances because of its variable location and volume. Intracerebral haemorrhage can be treated conservatively or surgically. Conservative treatment which is limited to intensive supportive care and treatment of associated brain oedema, is very important not only for patients who are planned to be treated conservatively alone but also for patients who have been operated. That means conservative treatment is mandatory to cure a patient with ICH but insufficient in some conditions. The big discussion is about determination of the necessity for surgical treatment which must be based on the clinical status of the patient and the location and size of the ICH. Another problem is the timing and method of surgery. In this paper all these parameters have been evaluated taking the results of a number of cases and personal experience into account.

PATIENTS AND METHOD

Between the years 1989–1993, 151 operated cases were analyzed retrospectively to detect the criteria leading to surgery. Aetiology was clarified as hypertension in 93 cases, vascular pathology in 18, tumour in three and in 37 cases no clear aetiological factor was present. Clinical status of the patients was determined using the grading system of Kanaya and is shown in (Table I) (5). The exact localization (Table II) and size of the intracerebral haematomas were determined by Kanaya classification and taking the biggest measurable diameter of the haematoma on CT pictures. Conservative therapy was chosen for haematomas below 10mm in diameter. Surgical therapy was preferred for those 10 to 30mm (6.6%, 10/151) for posterior fossa localization or in cases where specific aetiology was in doubt, and over 30mm in diameter (93.4%, 141/151). The STAGEs of ICHs and timing of the surgery are listed in (Table III). Two basic methods of surgery were carried out as conventional open surgery in 65 cases, free hand puncture and aspiration in 75 patients. In 50 of these 75 cases a thrombolytic agent (urokinase in a dose

of 5000 UI per day) was given into the haematoma cavity according to CT findings.

Table I : Neurological grading

KANAYA SCALE neurograde (NGR)	GLASGOW SCALE points (P)
NGR 1 ALERT	15 P
NGR 2 SLEEPY	15-P
NGR 3 STUPOR	12-14 P
NGR 4A SEMICOMA	7-11 P
NGR 4B SEMICOMA WITH HERNIATION	7-11 P
NGR 5 DEEP COMA	BELOW 7 P

Table II : CT localization and classification of the patients

LOCALIZATION	NO	%	
LOBAR	69	45.7	45.7
PUTAMINAL GR 1	7	4.6	
PUTAMINAL GR 2	3	2.0	
PUTAMINAL GR 3A	2	1.3	
PUTAMINAL GR 3B	2	1.3	40.4
PUTAMINAL GR 4A	20	13.2	
PUTAMINAL GR 4B	17	11.3	
PUTAMINAL GR 5	10	6.6	
THALAMIC GR 1A	0	0.0	
THALAMIC GR 1B	2	1.3	
THALAMIC GR 2A	1	0.7	
THALAMIC GR 2B	3	2.0	
THALAMIC GR 3A	0	0.0	
THALAMIC GR 3B		0	0.0
PONTINE	0	0.0	0.0
CEREBELLAR	15	9.9	9.9
TOTAL	151	100	100

Table III : Timing of the surgery

ICH STAGE	No	%
HYPERATUCE	64	42.3
ACUTE	63	41.7
SUBACUTE	21	13.9
CHRONIC	3	1.9
RESIDUAL	0	0
TOTAL	151	100

RESULTS

Overall mortality was 49%. Four percent of the survivors had no neurologic deficit and 15% could return to their previous life with minor disability, 26% had partial disability and 6% were totally disabled (Table IV).

Table IV : Outcome of Surgery

RESULTS	No. of CASES	%
FULLWORK	6	4.0
DISABILITY		
MINIMAL	23	15.2
PARTIAL	39	25.8
TOTAL	8	5.3
VEGETATIVE	1	0.7
DEAD	74	49.0
TOTAL	151	100

DISCUSSION

A joint study of a large number of cases states that the mortality rate among groups treated conservatively or surgically are quite different. While there were no significant differences in lower grade patients between the two groups, surgery seemed superior in high grade stuporous or comatose patients with a mortality rate approximately 10 – 40% lower than the same grade patients in the conservative group (4, 5). According to our observations, the distribution of mortality is in exact accordance with the clinical status of the patient (Table V). The timing of surgery should be precise. In some reports, hyperacute surgery in the first 24 hours was considered an absolute necessity (2, 3, 6). In our group overall mortality was highest for cases operated in the hyperacute period (Table VI). When we looked

Table V : Mortality rate vs clinical status

NEUROGRADING	No. of CASES	No. of DEATHS	%
NGR 1	8	1	12.5
NGR 2	20	3	15
NGR 3	31	6	19.3
NGR 4A	28	16	57.1
NGR 4B	4	3	75
NGR 5	60	45	75
TOTAL	151	74	49

at different groups of the same clinical status, a paradoxical situation was observed. Taking grade 4–5 patients into consideration, surgery as early as possible gave better results: 64.5% mortality (31/48) for hyperacute stage versus 76% (26/34) for acute surgery; but for grade 5 patients hyperacute surgery

Table VI : Timing of surgery			
STAGE	No. of CASES	No. of DEATHS	%
HYPERACUTE	64	37	57.8
ACUTE	63	29	46
SUBACUTE	21	8	38
CHRONIC	3	0	0
RESIDUEL	0	0	0
TOTAL	151	74	49

appeared to have a higher mortality rate. Subsequently, the necessity for surgery decreases in the subacute period. Our experience shows that there was difficulty in controlling active bleeding in cases operated very early. Consequently, in our opinion, unless rapid herniation occurs, the acute period is the best time for surgical treatment. This allows time for observation of the clinical status of the patient and the variation of grading and for to be sure for the outcome of surgical treatment. The puncture method has been presented to lower the risk of open surgery and 60% evacuation of the clot has been found enough to control high intracranial pressure (1, 7). In our group of patients, administration of thrombolytic agents decreased the mortality rate by 8% compared to simple puncture and aspiration. On the other hand in cases of the same clinical status, open surgery gave better results with a mortality rate of 16% which is lower than puncture and thrombolysis (Table VII).

Table VII : Mortality rate and surgical method			
METHOD	No. of CASES	No. of DEATHS	%
PUNCTURE	24	15	62.5
PUNCTURE+THROMBOLYSIS	50	28	56
OPEN SURGERY	77	31	40.2
Total	171	74	

Surgical alternatives were chosen according to the patients' clinical status and unless there is a definite contra–indication for anaesthesia, open surgery refined by microsurgical facilities seemed favourable for the treatment of ICH. In a number of cases evacuation of the clot was not satisfactory regarding the CT control on the following days. The mortality rate of this group was 25–35 % higher than the successfully operated group proved by CT: 45% mortality among 129 patients considered as successful surgical evacuation and 68.1% in the group which evacuation of haematoma (22 patients) was evaluated as unsatisfactory. This shows that whatever method is used, satisfactory evacuation of the intracerebral clot is essential.

Correspondence : Prof. Dr. Nurcan Özdamar
E.Ü.T.F., Department of Neurosurgery,
35100 Bornova, Izmir, Türkiye
Phone & Fax: 90 (232) 373 1330

REFERENCES

1. Backlund E, Holst H. Controlled subtotal evacuation of intracerebral haematomas by stereotactic technique. Surg. Neurol. 9:99-101 1978.
2. Broderick J, Brott T G, Tomsick T, Barsan W, Spilker J. Ultra-early evaluation of intracerebral haemorrhage. J Neurosurg. 72:195-199 1990.
3. Fujitsu K, Muramoto M, Ikeda Y, Inada Y, Kim I, Kuwabara T. Indications for surgical treatment of putaminal haemorrhage. J Neurosurg. 73:518-525 1990.
4. Juvela S, Heiskanen O, Poranen A, Valtonen S, Kuurne T, Katse M, Troupp H. The treatment of spontaneous intrecerebral haemorrhage: A prospective randomized trial of surgical and conservative treatment. J Neurosurg 70:755-758, 1989.
5. Kanaya H, Kuroda K. Development in neurosurgical approaches to hypertensive intracerebral haemorrhage in Japan. In Intracerebral Haematomas, edited by H.H.Kaufman, Raven Press.Ltd NewYork 1992:197-209.
6. Kaneko M, Koba T, Yokoyama T. Early surgical treatment for hypertensive intracerebral haemorrhage. J Neurosurg 46:579-583, 1977.
7. Kaufman H H. Stereotactic aspiration with fibrinolytic and mechanical assistance. In Intracerebral Haematomas, edited by H.H.Kaufman, Raven Press.Ltd., NewYork, 1992:181-185.