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Hypertensive supratentorial intracerebral Hemorrhage: early surgery and functional Outcome; a tertiary care hospital experience from Karachi, Pakistan.

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HYPERTENSIVE SUPRATENTORIALINTRACEREBRAL HEMORRHAGE: EARLY SURGERY AND FUNCTIONAL OUTCOME; A TERTIARY CARE HOSPITAL EXPERIENCE FROM KARACHI, PAKISTAN.

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ABSTRACT

BACKGROUND: Spontaneous supratentorialintracerebral hemorrhage (ICH) has a high morbidity and mortality and places a significant burden on health and social services. The role and timing of operative neurosurgical intervention remain controversial and the practice and timing of surgery continue to be haphazard. **METHODOLOGY:** Our study was a descriptive study conducted at Civil hospital Karachi, Pakistan. Sample size was calculated. The sampling technique of our study was non probability. The data was collected and analyzed using spssvs 17. Data was observed for any descriptive and inferential statistics. **RESULTS:** There were 38 males (63.3%) and 22 females (36.7%). The mean age of patients was 52.7 years. 36 patients (60%) had right hemispheric hemorrhage while 24 patients (40%) had left hemispheric hemorrhage. 48 patients (80%) had typical putaminal hemorrhage while 6 (5%) patients had subcortical and 6 (5%) occipital bleed. Regarding the improvement of neurological status, 16 patients (26%) were able to perform daily activities. 9 patients (15%) were able to take care of themselves at home while 07 patients (11%) required partial care. 10 patients (16%) were vegetative and 18 (30%) patients died. **CONCLUSION:** Our study revealed that early evacuation of large hematoma resulted in short ICU and short hospital stay, less postoperative complications and overall good functional recovery particularly in middle aged and younger patients with non dominant hemispheric hemorrhage therefore early surgical intervention definitely has the role in the management of extensive intracerebral hemorrhage.

KEYWORDS

Intracerebral hemorrhage, Right hemisphere hemorrhage, Craniotomy, Clot evacuation

INTRODUCTION

Spontaneous supratentorialintracerebral hemorrhage (ICH) has a high morbidity and mortality and places a significant burden on health and social services. The role and timing of operative neurosurgical intervention remain controversial and the practice and timing of surgery continue to be haphazard. Operative intervention is thought to be beneficial in stopping bleeding, preventing rebleeding, and removing the mass effect to prevent secondary brain damage.

The outcome for patients suffering an acute

intracerebral hemorrhage (ICH) is determined by the volume and growth of the underlying hematoma. Blood pressure often reaches extremely high levels and is a known predictor of outcome[2].

Accurate prediction of the outcome in ICH patients is important for several reasons: a reliable prognosis must be given to patient and relatives as soon as possible, realistic rehabilitation goals should be set and resources should be allocated in the most efficient way. Predicted outcome is also useful in deciding on possible interventions and comparing different treatments for ICH[3].

from minimum of 2 hours to a maximum of 40 hours with mean time delay of 8.95 hours. Mean time delay from admission to operating time was 3 hours. Regarding clinical symptoms (table 1), 22 patients (36.7%) the ictus was preceded by headache. 18 patients (30%) developed episodes of vomiting. 32 patients (53.35%) were hemiplegic with no movement on the weaker side even on severe painful stimulus while 28 patients (46.7%) had hemiparesis with varying degree of movement on weak side on painful stimulus. 30 patients (50%) did not have incomprehensible sound on painful stimulus and were completely aphasic. All patients had gaze preference away from the side of lesion and had plantar suppling on the weak side. Mean Glasgow coma score was 8/15.

Cerebral angiography was performed in 5 patients in whom bleed was extending from the basal ganglia into Sylvian fissure, to rule out aneurysmal bleed. All patients had midline shift of more than 1cm. Intraventricular extension of basal ganglia hemorrhage was noticed in 8 patients (13.3%). Volume of clot ranged from 30cc to 40cc with mean volume of 35cc.

All patients underwent conventional open craniotomy and evacuation of clot. Total stay in hospital of these patients was ranging from 5 days to 34 days. The mean hospital stay was 14.67 ± 7.65 days.

Regarding the improvement of neurological status, 16 patients (26%) were able to perform daily activities. 9 patients (15%) were able to take care of themselves at home while 07 patients (11%) required partial care. 10 patients (16%) were vegetative and 18 (30%) patients died (table 2). Patient's deaths with respect to site of hemorrhage are shown in (table 3). The complications in our patients are shown in (figure 2).

It was observed in our study that patients with non dominant hemispheric bleed made good functional recovery.

Left basal ganglia bleed and hemorrhage with ventricular rupture caused the highest fatalities. Majority of fatal cases died of complications while mortality was negligible in whom no complications developed.

Table 1 : showing presenting clinical signs and symptoms of patients

SYMPTOMS AND SIGNS	NO OF PATIENTS	PERCENTAGE
PRE ICTUS HEADACHE	22	36.7%
VOMITING	18	30.0%
HEMIPLEGIA	32	53.3%
HEMIPARESIS	28	46.7%
APHASIA	30	50.0%

Figure 1: figure showing the location of hemorrhage

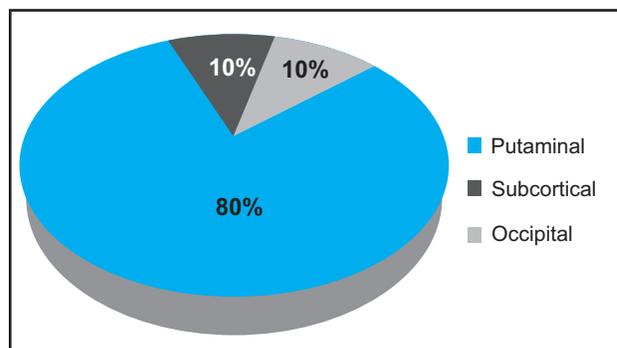


Figure 2: figure showing complication in study participants

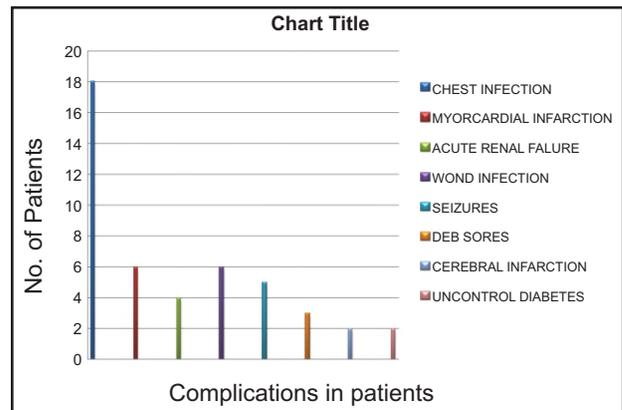


Table 2 : Outcome at 6 month follow up

OUTCOME	NO OF PATIENTS	PERCENTAGE
Normal	16	26%
Self care	09	15%
Partial care	07	11%
Vegetative	10	16%
Died	18	30%

Table 3 : MORTALITY WITH RESPECT TO SITE AND

INTRAVENTRICULAR EXTENSION

SITE	NO OF PATIENTS	MORTALITY
Right hemisphere	36	8(22.2%)
Left hemisphere	24	10(41.6%)
Intraventricular extension	8	6(75%)

DISCUSSION

Spontaneous intracerebral hemorrhage is a serious public health problem and is fatal in 30%–50% of all occurrences. The role of open surgical management of supratentorial intracerebral hemorrhage is still unresolved. A recent consensus conference sponsored by the National Institutes of Health suggests that minimally invasive techniques to evacuate clots appear to be a promising area and warrant further investigation[7]. Intracerebral hemorrhage is a devastating disease, and no specific therapy has been proven to reduce mortality in a randomized controlled trial. However, management in a neuroscience intensive care unit does appear to improve outcomes, suggesting that many available therapies do in fact provide benefit. In acute phase of intracerebral hemorrhage care, strategies aimed at minimizing ongoing bleeding include reversal of anticoagulation and modest blood pressure reduction. In addition, the monitoring and regulation of glucose levels, temperature and, in selected cases, intracranial pressure are recommended by many groups. Selected patients may benefit from hematoma evacuation or external ventricular drainage. Ongoing clinical trials are examining aggressive blood pressure management, hemostatic therapy, platelet transfusion, stereotactic hematoma evacuation and intraventricular thrombolysis. Finally preventing recurrence of intracranial hemorrhage is of pivotal importance, and tight blood pressure management is paramount[8].

In an international study the advantage Minimally Invasive Stereotactic puncture therapy (MISPT) compared with conventional craniotomy (CC). The advantage Minimally Invasive Stereotactic puncture therapy over conventional craniotomy was not only displayed in short-term outcome such as minute trauma and safety, but also seemed to be feasible and had a trend towards improved long-term outcome. The total incidence of complication in the MISPT group was lower than that of the CC group (32.3%

and 80.7% respectively). The most common complication reported in this study was digestive tract hemorrhage while if we compare it to our study it was chest infection[9].

Another study reported that Decompressive hemicraniectomy without clot evacuation appears feasible in patients with large ICH and deserves further investigation, preferably in a randomized controlled setting in contrast our study showed acceptable results with clot evacuation[10].

In one study authors reported that DC with hematoma evacuation might be a useful surgical procedure for selected patients with large hemispheric hypertensive ICH[11]. We also operated the patients with hypertensive ICH with decompressive craniotomy and clot evacuation.

Decompressive hemicraniectomy with hematoma evacuation is life-saving and improves unfavorable outcomes in a select group of young patients with large right hemispherical ICH[12]. Also in our study by performing clot evacuation, the mortality was lower in right hemispherical hemorrhage.

One international study[13] reported The average hematoma volume in their study was 58.7 mL in the craniotomy group. The mean GCS in this study was 9/15 This study also reported rebleeding in one patient. They reported 20% deaths in craniotomy group. In our study the mean clot volume was 35 ml. The mean GCS in our study was 8/15. The mortality in our study was 30%.

An international study reported 24 patients who underwent DC for hemispheric hypertensive ICH. Three patients who died were within the first month. They also reported outcomes at the last follow-up included a good recovery in one patient, moderate disability in five patients, severe disability in six patients, vegetative state in seven patients, and dead in two patients [14].

In contrast none of our patient died in first month. 16 patients (26%) were able to perform daily activities(good recovery). 9 patients (15%) were able to take care of themselves at home(minor disability) while 07 patients (11%) required partial care (moderate disability). 10 patients (16%) were vegetative and 18 (30%) patients died.

In another study[15] location of hematoma was in the basal ganglia in 36 patients (49%), lobar in 30 (41%) and both lobar and subcortical in 7 patients (10%) and the average ICH volume was 81 cc. The early clot evacuation, especially in right hemispherer hemorrhages in younger patients who are

not moribund may decrease mortality which was similar to our study. In contrast the most common location in our study was putamen followed by subcortical and occipital. The average volume was 35cc.

The Hematoma evacuation is associated with significant reduction in PeriHematoma Edema[16].

One study[17] suggests 59% patients in the early surgery group had an unfavourable outcome versus 62% patients in the initial conservative treatment group. Therefore conservative treatment should be given initially.

An international study[18] compares modern techniques with craniotomy. With the introduction of the minimally invasive techniques and the evolution of the neuroendoscope and hemostatic agents, the median operative time and blood loss have been significantly decreased although the hematoma evacuation rates were similar between the endoscope (90%) and craniotomy (85%) groups. This represents an important advancement in treating spontaneous supratentorial ICH, and provides a measured preview of the promising results that can be expected in the future. Further studies should be conducted comparing the craniotomy and clot evacuation with modern techniques.

The limitations of our study included the lack of control group and relatively smaller sample size.

CONCLUSION

Our study revealed that early evacuation of large hematoma resulted in short ICU and short hospital stay, less postoperative complications and overall good functional recovery particularly in middle aged and younger patients with non dominant hemispheric hemorrhage therefore early surgical intervention definitely has the role in the management of extensive intracerebral hemorrhage.

Careful case selection and optimum timing for surgical treatment have contributed to the reduced overall mortality from hypertensive intracerebral hemorrhage and to the increased number of cases with the better quality of life.

REFERENCES:

1. Gregson, B.A., et al., *Individual patient data subgroup meta-analysis of surgery for spontaneous supratentorial intracerebral hemorrhage*. Stroke. **43**(6): p. 1496-1504.

2. Anderson, C.S., et al., *Rapid blood-pressure lowering in patients with acute intracerebral hemorrhage*. New England Journal of Medicine. **368**(25): p. 2355-2365.
3. Hallevy, C., et al., *Spontaneous supratentorial intracerebral hemorrhage*. Journal of neurology, 2002. **249**(12): p. 1704-1709.
4. Balami, J.S. and A.M. Buchan, *Complications of intracerebral haemorrhage*. The Lancet Neurology. **11**(1): p. 101-118.
5. Aguilar, M.I. and W.D. Freeman. *Spontaneous intracerebral hemorrhage*. in *Seminars in neurology*: © Thieme Medical Publishers.
6. Xi, G., R.F. Keep, and J.T. Hoff, *Mechanisms of brain injury after intracerebral haemorrhage*. The Lancet Neurology, 2006. **5**(1): p. 53-63.
7. Abdu, E., D.F. Hanley, and D.W. Newell, *Minimally invasive treatment for intracerebral hemorrhage*. Neurosurgical focus. **32**(4): p. E3.
8. Brouwers, H.B. and J.N. Goldstein, *Therapeutic strategies in acute intracerebral hemorrhage*. Neurotherapeutics. **9**(1): p. 87-98.
9. Zhou, H., et al., *A prospective controlled study: minimally invasive stereotactic puncture therapy versus conventional craniotomy in the treatment of acute intracerebral hemorrhage*. BMC neurology. **11**(1): p. 76.
10. Heuts, S.G., et al., *Decompressive hemicraniectomy without clot evacuation in dominant-sided intracerebral hemorrhage with ICP crisis*. Neurosurgical focus. **34**(5): p. E4.
11. Takeuchi, S., et al., *Decompressive craniectomy with hematoma evacuation for large hemispheric hypertensive intracerebral hemorrhage*, in *Brain Edema XV*, Springer. p. 277-279.
12. Murthy, J.M.K., et al., *Decompressive craniectomy with clot evacuation in large*

- hemispheric hypertensive intracerebral hemorrhage*. Neurocritical care, 2005. **2**(3): p.258-262.
13. Nagasaka, T., et al., *Early recovery and better evacuation rate in neuroendoscopic surgery for spontaneous intracerebral hemorrhage using a multifunctional cannula: preliminary study in comparison with craniotomy*. Journal of Stroke and Cerebrovascular Diseases. **20**(3): p. 208-213.
 14. Takeuchi, S., et al., *Ventriculomegaly after decompressive craniectomy with hematoma evacuation for large hemispheric hypertensive intracerebral hemorrhage*. Clinical neurology and neurosurgery. **115**(3): p.317-322.
 15. Esquenazi, Y., et al., *Decompressive hemicraniectomy with or without clot evacuation for large spontaneous supratentorial intracerebral hemorrhages*. Clinical neurology and neurosurgery. **128**: p. 117-122.
 16. Mould, W.A., et al., *Minimally invasive surgery plus recombinant tissue-type plasminogen activator for intracerebral hemorrhage evacuation decreases perihematoma edema*. Stroke. **44**(3): p. 627-634
 17. Mendelow, A.D., et al., *Early surgery versus initial conservative treatment in patients with spontaneous supratentorial lobar intracerebral haematomas (STICH II): a randomised trial*. The Lancet. **382**(9890): p. 397-408.
 18. Wang, W.-H., et al., *Endoscopic hematoma evacuation in patients with spontaneous supratentorial intracerebral hemorrhage*. Journal of the Chinese Medical Association. **78**(2): p. 101-107.

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Author's contribution:

Muhammad Imran; concept, study design, data collection, data analysis, manuscript writing, manuscript review

Atiq Ahmed Khan; data collection, data analysis, manuscript writing, manuscript review

Syed Ijlal Ahmed; data collection, data analysis, manuscript writing, manuscript review

Shiraz Ahmed Ghouri; data analysis, manuscript writing, manuscript review

Muhammad Osama Farooqi; data analysis, manuscript writing, manuscript review

Alizay Rashid Khan; data analysis, manuscript writing, manuscript review

Majid Chandio; data collection, data analysis, manuscript writing, manuscript review