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Surgical intervention of intra: Cerebral hemorrhage and its outcomes

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Abstract
Objective: Intra-cerebral hemorrhage is one of the most powerful reasons leading to a high mortality rate in general, which may reach 50%. In this research, we learned about the consequences of intra-cerebral hemorrhage and the disabilities it can cause, as well as the results of surgical intervention, which is much better than any other management. Thus, the purpose of this research is to determine the effectiveness of surgical intervention of cerebral hemorrhage and its outcomes for the patients.
Methods: In our medical system, the patient aged 21-80 years admitted to the neurosurgery department to be given the proper treatment of intra-cerebral hemorrhage from 1 March 2008 and 1 April 2013. Patients classified 2 groups Surgical group (n =28) and nonsurgical group (n=27). Certain criteria to be admitted like: Glasgow Coma Score Range from 9 to 14, volume of the hemorrhage ≥20 mL, and the start of treatment within twenty four hours.
Results: With the analysis, the duration of staying in the hospital was different between two groups while the duration of staying in the intensive care unit showed no difference between them. Within the 100 days follow up, the rate of mortality was 15%, Included 4 of 28 in the surgical group and 57% include 16 of 27 in the nonsurgical group. The surgery gets benefit in decreasing the level of mortality and improving level of GCS during the period of follow up in univariate analysis. While in multivariate analysis, the mortality rate differed between two groups but GCS showed no obvious difference in the follow up.
Conclusion: Although the long period of staying in hospital, the management of intra-cerebral hemorrhage by surgery give lower level of mortality.

Keywords: intra-cerebral hemorrhage, surgical intervention, outcome

Introduction

The most common cause of disability of stroke is the intra-cerebral hemorrhage, it reaches 15% of the rate of mortality and morbidity [1, 24]. During one month nearly forty percent of patients have intra-cerebral hemorrhage die and who still alive had disabilities of different degrees [4, 7, 12, 17].

Increase in the volume of ICH indicates the poor out come and an important item in determination of dysfunction of neurological function. [5, 11] As hemorrhage increased in size as mortality rate increase, because it relate with the size and site of bleeding [7, 17].

Hemorrhage classified according to etiology into primary and secondary, primary hemorrhage manly due to hypertension while secondary type due to other causes like trauma and tumor. There are different manifestations of ICH, general manifestations are like severe headache with vomiting and disturbance level of consciousness, other symptoms appear according to the site of bleeding, as example if it was lobar hematoma, paresis of leg and arm with aphasia appear, and if it is in cerebellum it cause compression of brain stem.

Once ICH identified, it must undergo imaging through CT which proved sensitivity more than 90% but some cases of ICH do not appear with CT, it need MRI which reach sensitivity 100% but as CT is more available and more easy it is considered number one in diagnosis. If the cause was hypertension with younger age, certain diagnostic imaging required as CT angiography or digital subtraction angiography. According to surgical management, some techniques can be used and give better outcomes like neuroanesthesia. Some trials of surgical evacuation of ICH get no benefit, in our research we seek to choose and select patients who were at high risk for expansion of hematoma as they were more aimed to give better outcomes [2, 3, 21, 23, 27, 31].

The purpose of this research is to assess surgical evacuation of ICH and its outcomes in comparison with those who do not choose operation.

Surgical management summarized in the following:

Open craniotomy with evacuation, this technique gives enough hemostasis with complete removal of hematoma,

Evacuation through endoscope: it gives better outcome.

CT guided stereotactic: but it cause rebreeding.

Material and Methods

Data collected from patients who come to hospital from 1 March 2008 to 1 April 2013, certain criteria included to collect the data: ICH must be non-traumatic on CT examination of the head, the patient must be evaluated within 24 hours with CT, the volume of ICH more than 20 ml, patient age 21-80 years, on the other hand other criteria were excluded like high or low GCS (3-5) or more than 15 and past history of stroke.

Clinical data: Radiological data collected with the clinical one

through doctors of neurosurgery department within 100 days follow up. Data included sex, age and history of chronic diseases like DM, hypertension, liver diseases and renal failure, level of glucose, BP, PT, PTT were recorded with follow up within 100 days. GCS was detected to measure clinical outcome. Hospital and ICU stay length was recorded also. According to the site and the size of hemorrhage, the technique of the surgery should be determined, because there were no guidelines for surgery. The purpose of surgery was complete removal of the hematoma, surgery exclusively preferred in case of cerebral herniation which determined by pupil response and posture which were abnormal.

Both two groups (surgical and non-surgical) took the medical supportive treatment including (control of hypertension, IV fluids, keeping level of glucose within normal and supportive nutrition.

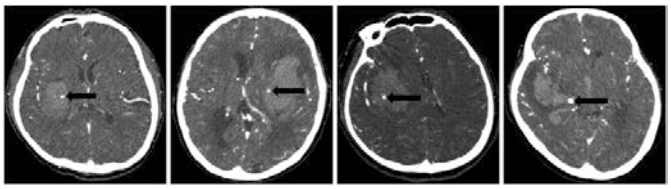

Fig 1: This figure show active bleeding in the brain within 24 hours

Results

Patients who cope with inclusion criteria were 55, analysis of their data showed different techniques of surgery done with them, 53 of 55 recorded high blood pressure.30 patients had hematoma on the RT side, while 25 patients had hematoma on LT side. Comparison between both two groups (surgical and non- surgical) based on the following data (age, sex, GCS score, volume of hemorrhage, outcome. length of stay in hospital and ICU, mortality rate).

Twenty eight patients were the surgical group; twenty seven patients were non-surgical group. Within eight hours and follow up by CT the patients received operation and resulted in the following: eight patients undergo operation within five hours and hematoma expansion occurred only in three, eight patients undergo operation within 20 hours and hematoma expansion occurred in only three.

GCS score was in group one (surgical group) 11.78 and in group two (non-surgical) 11.49

Volume of ICH initially was 32.8 in group two and was 39.7 in group one, with follow up, volume in group two was44.6 while in group one volume was 53.3.

No obvious difference between both groups in the length of stay in hospital and ICU, group one (surgical group) recorded more period of stay in hospital because group two (non-surgical) showed early death, and so no long period to stay in hospital.

With follow up for 100 days after discharge, mortality rate reach 4 of 28 in group one, but in group two, mortality rate reach 16 of 27.

Positive effect gained from surgical management to decrease mortality rate within 100 days follow up.

Discussion

In our research, within 100 days follow up after discharge, mortality rate was less with group one than group two, but clinical outcome did not show difference between both groups.

As volume of hematoma measured early after appearance of symptoms, it can be considered a critical element in determination of mortality and poor outcome, because its volume expand within first twenty four hours [4, 5, 7, 13, 17, 25].

To stop this expansion there are 2 trials, either surgical or non-surgical. Both trials show no difference in the outcome, but differ in decreasing mortality rate at 100 days follow up [7, 26].

Even the patients who get non-surgical management then undergo operation in late time showed poor outcome, [3, 14, 21, 23, 31]. Because the time of treatment had good effect on restriction the volume of hematoma because expansion of hematoma increase obviously in twelve hours after onset. Different times after onset show different expansion of hematoma.

Different surgical techniques were done whether open craniotomy or endoscopic evacuation [6, 27, 30].

Hospital stay was longer with group one than group two. Different causes lead to death with group one like pneumonia, cardiac causes and others. Despite of mortality rate is lower in group one but quality of life still poor because long stay in ICU lead to destruction of internal capsule and surgical management could not improve or convert neurological problems.

Conclusion

Management of patients with ICH by surgery showed lower mortality rate despite the length of duration of stay in hospital. The surgical outcome does not differ with sex or the site of bleeding while the age and the clinical assessment in admission time affect the outcome of ICH, also the age considered aggravating items. Poor outcome is expected when the volume of hematoma is large, old aged patients. also the deep site of hematoma aggravate outcome.

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