

Introduction

Surgical management of intracerebral hemorrhage remains a highly debated topic. Technology has advanced to allow for use of minimally invasive techniques, facilitating evacuation of intracerebral hematoma with minimal cortical dissection. We report a series of cases where endoscopic/exoscopic evacuation of intracerebral hematoma was performed using the Apollo device (Penumbra) to break and remove the clot.

Methods

A retrospective analysis of cases of intracerebral hemorrhage, which underwent endoscopic/exoscopic evacuation of hematoma using the Apollo device (Penumbra) was performed at our institution. A small craniotomy was performed, and endoscopic/exoscopic tube system placed to the most superficial portion of the hemorrhage. The Apollo system (Penumbra) was utilized with endoscopic/exoscopic visualization. The primary outcome included the difference in pre-operative and post-operative clot volume on computed-tomographic (CT) scan. The secondary outcomes included the change from pre-operative to immediate post-operative Glasgow Coma Scale (GCS), length of ICU stay and length of hospital stay.

Results

Fifteen patients (7 females and 8 males) were included in this series. The mean age was 65±10years. The location of hematoma included thalamus (n=6), frontal lobe (n=4), basal ganglia (n=2), external capsule (n=2) or occipital lobe (n=1). The cause of bleed included hypertension (n=11), amyloid angiopathy (n=2), aneurysm rupture (n=1) or trauma (n=1). The mean time from onset to surgery was 40.5±24.2hours. After surgical evacuation of hematoma, the mean clot volume on CT-scan was reduced from 28.2±20.6ml pre-operatively to 6.0±5.3ml post-operatively (P<0.0001). There was no statistically significant difference in the mean pre-operative and immediate post-operative GCS (p>0.05). Two patients expired during admission. The mean length of ICU stay for remaining patients was 10.4±9.1days, and the mean length of hospital stay was 24.0±20.9days.

Conclusions

Minimally invasive evacuation of intracerebral hematoma with the Apollo system (Penumbra) is a safe and effective option for select patients.

Learning Objectives

-Use of minimally invasive techniques for intraparenchymal hemorrhage evacuation

-

References

Tan LA, Lopes DK, Munoz LF, Shah Y, Bhabad S, Jhaveri M, Moftakhar R. Minimally invasive evacuation of intraventricular hemorrhage with the Apollo vibration/suction device J Clin Neurosci. 2016 May;27:53-8. doi: 10.1016/j.jocn.2015.08.037. Epub 2016 Jan 8.

Turner RD, Vargas J, Turk AS, Chaudry MI, Spiotta AM. Novel device and technique for minimally invasive intracerebral hematoma evacuation in the same setting of a ruptured intracranial aneurysm: combined treatment in the neurointerventional angiography suite. Neurosurgery. 2015 Mar;11 Suppl 2:43-50; discussion 50-1. doi: 10.1227/NEU.0000000000000650.

