

Risk Factors Associated With Delayed Traumatic Intracerebral Hemorrhage After Decompressive Craniectomy in Elderly Patients With Acute Subdural Hematoma

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Introduction

Decompressive craniectomy (DC) has been the most chosen operative technique for decreasing the intracranial pressure in patients with acute subdural hematoma. Yet, DC has some severe complications such as delayed traumatic intracerebral hemorrhage (DT-ICH). This study investigated the variable factors which may cause DT-ICH post-operatively.

Methods

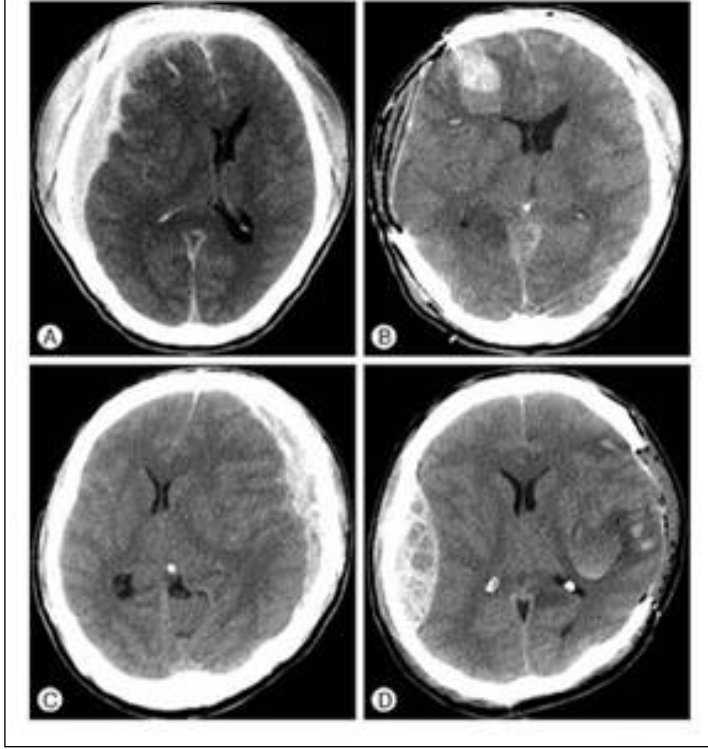
We retrospectively reviewed 72 acute SDH patients above 60 year-old whom underwent DC at our institution between January 2010 and January 2012. All patients were analyzed based on the information acquired from the pre-operative clinical factors (gender, past history, cause of injury, aspartate aminotransferase (AST)/ alanine transaminase (ALT), prothrombin time (PT), international normalized ratio (INR), platelet count, presence of contusional hemorrhage in the preoperative computed tomography (CT), thickness of hematoma, and degree of midline shift and, compression ratio (midline shift/hematoma thickness)). Immediate post-operative CT scan was carried out in all patients. Then, the relationship between each parameter and presence of DT-ICH after DC was analyzed statistically.

Table 2. Multivariate analysis of factors associated with delayed traumatic intracerebral hemorrhage

	β	95% confidence interval	p-value
Thickness (mm)	0.898	0.679-1.189	0.012
Midline shifting (mm)	1.057	0.797-1.402	0.737
Compression ratio	2.751	0.170-44.601	0.011
Initial CT finding	1.485	0.888-2.417	0.167
INR [†]	0.450	0.102-1.985	0.030
Platelet count ^{††}	0.366	0.051-2.599	0.041
AST/ALT ^{†††}	0.786	0.241-2.565	0.476
HTN	0.856	0.699-1.314	0.648
DM	0.865	0.573-1.495	0.560

Results

Out of 72 SDH elderly patients, DT-ICH occurred in 26 patients (36%) while the rest of 46 patients (64%) had no further hemorrhagic event. Of many variable factors to cause DT-ICH, male, low platelet count, INR prolongation, presence of contusional hemorrhage, hematoma thickness and compression ratio showed a statistical significance in univariate analysis ($p < 0.05$). Whereas in multivariate analysis, low platelet count, INR prolongation, thicker hematoma and low compression ratio demonstrated a statistical significance ($p < 0.05$).



Conclusions

According to our study, patients with thicker hematoma and low compression ratio had a higher tendency of DT-ICH after DC. This information can be crucial in predicting the possibility of DT-ICH in higher risk elderly patients.

Learning Objectives

Not only a bleeding tendency but also a radiological information from the brain CT scans can be useful in predicting the DT-ICH in the elderly patients after DC.