Endovascular management of acute epidural hematomas: clinical experience with 80 cases.

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CNS 2017 ANNUAL MEETING BOSTON, MASSACHUSETTS OCTOBER 7–11,2017

Introduction

Small acute epidural hematomas (EDHs) treated conservatively carry a nonmeasurable risk of late enlargement due to middle meningeal artery (MMA) lesions. Patients with EDHs need to stay hospitalized for several days, with neurological supervision and repeated CT scans. In this study, the authors analyzed the safety and efficacy of the embolization of the involved MMA and associated lesions.

Methods

The study group consisted of 80 consecutive patients harboring small- to medium-sized EDHs treated by MMA embolization between January 2010 and December 2014. A literature review cohort was used as a control group.

Summary of clinical data in 80 patients with EDH

Features	Value	%
GCS score on admission		
14–15	61	76.2
12–13	10	12.5
≤11	9	11.2
Total	80	100.0
Hospitalization duration (days)		
Median	7	
Mean	10.5	
Admission to femoral puncture (days)		
Median	4	
Mean	4.6	

Causes of head injury in 80 patients with EDH

Trauma Mechanism	No.	%
Fall	26	32.5
Vehicle vs pedestrian	15	18.7
Car accidents	12	15.0
Motorcycle accidents	9	11.2
Assault	9	11.2
Other/unknown*	9	11.2
Total	80	100.0

* Buried alive by landslide or trench collapse, cranial collisions while playing football.

Cranial lesions and topography in 80 patients with EDH

CT Findings	Value (%)
Associated lesions	
Fracture	63 (78.75)
Contusion & fracture	7 (8.75)
Fracture & tSAH	4 (5.0)
Contusion & tSAH	1 (1.2)
Contusion	1 (1.2)
Pneumocephalus	1 (1.2)
No associated lesions	3 (3.7)
EDH topography	
Temporal—lateral	29 (36.2)
Temporal pole	28 (35.0)
Frontal	11 (13.7)
Parietal	9 (11.2)
Frontotemporal	3 (3.7)

tSAH = traumatic SAH.

Results (Continued)

In contrast, the control cohort from the literature consisted of 471 patients, 82 (17.4%) of whom shifted from conservative treatment to surgical evacuation.

Results

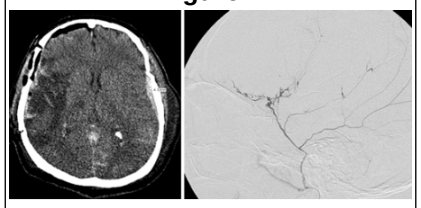
The causes of head injury were falls, traffic-related accidents (including car, motorcycle, and pedestrian vs. vehicle accidents), and assaults. The EDH topography was mainly temporal (lateral or pole). Active contrast leaking from the MMA was seen in 57.5%; arteriovenous fistulas between the MMA and diploic veins were observed in 10%, and MMA pseudoaneurysms were found in 13.6% of the cases. Embolizations were performed under local anesthesia in 80% of the cases, with N-butyl-2-cyanoacrylate, polyvinyl alcohol particles, or gelatin sponge (or a combination of these), obtaining MMA occlusion and complete resolution of the vascular lesions. All patients underwent follow-up CT scans between 1 and 7 days after the embolization. In the 80 cases in this series, no increase in the size of the EDH was observed, and the clinical evolution was uneventful, without Glasgow Coma Scale score modification after embolization and with no need for surgical evacuation.

Angiographic ndings in 80 patients with EDH

Angiographic Finding	Value (%)
Active contrast extravasation	46 (57.5)
MMA wall irregularities	8 (10.0)
Acute contrast extravasation & pseudoaneurysm	7 (8.7)
Acute contrast extravasation & AVF	5 (6.2)
Pseudoaneurysm	3 (3.7)
AVF	2 (2.5)
Pseudoaneurysm & AVF	1 (1.2)
Choroidal blush	1 (1.2)
MMA wall irregularities & ICA aneurysm	1 (1.2)
Normal	6 (7.5)
Total	80

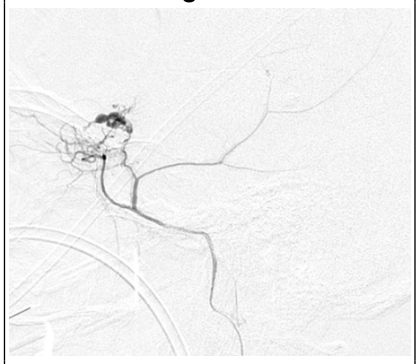
ICA = internal carotid artery.

Figure 1



Left: Axial CT showing bilateral trauma, surgically treated on the right side, with laminar EDH on the left side. Right: Angiogram obtained with microcatheterization of the MMA showing acute contrast extravasation related to the left-sided EDH.

Figure 2



Angiogram showing MMA pseudoaneurysm.

Conclusions

This study suggests that MMA embolization is a highly effective and safe method to achieve size stabilization in nonsurgically treated acute EDHs.

Learning Objectives

Identify therapeutic alternatives to treatment of epidural hematomas

References

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