Abstract  The posterior fossa is an uncommon site for epidural hematomas. Clinical progress is silent and slow, but the deterioration is sudden and quick to become fatal if not promptly treated. Early recognition is therefore extremely important. The recommended treatment for posterior fossa epidural hematoma is surgical evacuation soon after the diagnosis, since the posterior fossa contains vital structures. However, conservative management under close clinical and radiological supervision can be applied in patients without mass effect. In our study, a review of 73 cases with posterior fossa epidural hematoma among a total number of 737 patients with epidural hematoma is presented, and a new neuroradiological classification is proposed in order to determine the appropriate type of treatment. In this series, 14 patients were treated conservatively, while 59 required surgery. The conservatively treated 9 pediatric and 5 adult patients, and 51 of the 59 surgically treated cases, in other words a total of 65 of the 73 patients, showed excellent recovery; 4 patients treated surgically had a moderate disability, and 4 patients died (overall mortality 5.4%). The critical factors influencing outcome were the neuroradiological class, the level of consciousness just before the operation, and the other systemic and/or intracranial traumatic lesions. In this study, the critical observation was that the neuroradiological findings were earlier, more reliable and predictive than the clinical findings. Therefore, based upon the obliteration of perimesencephalic cisterns and/or displacement of the fourth ventricle, a new neuroradiological classification was designed for decision-making in management.

Key words  Computed tomography · Epidural hematoma · Head trauma · Occipital fracture · Posterior cranial fossa

Introduction

Posterior fossa epidural hematoma (PFEDH) is an uncommon but grave complication of head trauma. It is much less common than supratentorial epidural hematoma (EDH), but the incidence seems to have increased with awareness of the possibility of PFEDH [1, 5, 19, 21, 29, 33, 43, 44, 50]. It may cause rapid and fatal deterioration of the patient by compression of the brain stem, usually without prior warning signs, if not diagnosed early and treated promptly. Early recognition before clinical signs occur and surgical evacuation of the hematoma when necessary are therefore extremely important. Although the diagnosis is difficult and rare, and the mortality is high, the diagnosis has become much easier and the prognosis better since the introduction of computed tomography (CT) into clinical practice [5–7, 16, 21, 33, 39–41, 43]. Furthermore, since the advent of CT, there has been an increasing number of PFEDHs without mass effect treated conservatively with good results, especially in children [27, 35], but also in adults.

In this article, we will add a further 73 cases with PFEDHs to the literature and discuss the subject in the light of the accessible literature. In PFEDH cases, clinical observation alone is not adequate, and to await clinical deterioration risks disaster; our observations dictate that CT findings are more important and predictive than clinical findings. The relationship between some neuroradiological findings and clinical progress is emphasized; a new neuroradiological classification is proposed in regard to surgical indication for PFEDH, since the criteria for choosing surgery or conservative treatment for PFEDHs have
not been fully defined yet. This series suggests that the con-
servative management of PFEDHs without mass effect
may provide good results, and is the first report to describe
the nonsurgical treatment of PFEDH in adults.

**Materials and methods**

**Patient population**

Thirty-seven cases in the series were diagnosed and treated
at the Department of Neurosurgery, Istanbul School of
Medicine, University of Istanbul, from January 1982 to Oc-
tober 1992, and the other 36 traumatic PFEDH cases were
managed at Kartal Research and Teaching Hospital, Istan-
bul, between January 1993 and May 1997. There were 43
male and 30 female patients, aged between 2 and 59 years
(mean 14.9). All hematomas were of traumatic origin.
Head trauma occurred following motor vehicle accidents
in 39 of our patients, and the other 34 cases were owing to
falling from height.

**Evaluation**

All cases were diagnosed by CT among a total number of
737 EDH patients (9.9% of all EDH cases). The clinical
course of the traumatic PFEDH was classified according
to the proposal of Hooper [23] as acute, subacute, and
chronic, with the onset of symptoms within the first 24 h
of trauma, until the 7th day, and later, respectively. The
Glasgow Coma Scale (GCS) was used to assess the level
of consciousness of the patients, and the Glasgow Outcome
Scale was used in the surviving patients [25, 26]. Obliter-
ation of the perimesencephalic cisterns (especially the
quadrigeminal cistern), the compression and/or displac-
ment of the fourth ventricle, and the presence of hydro-
cephalus were carefully studied to assess the mass effect
of the hematoma, and so to determine the appropriate type
of treatment for PFEDH. According to these findings, the
patients in the series were divided into two distinct groups.
Group A (conservative or nonsurgical group); there was
no mass effect. The perimesencephalic cisterns were fully
open; the fourth ventricle was not compressed or displaced;
hydrocephalus was not present (Fig. 1). Group B (surgical
group); there was a mass effect to some degree. Partial to
total obliteration of the perimesencephalic cisterns and/or
compression, and/or displacement of the fourth ventricle
was observed; hydrocephalus was not present in the par-
tial obliteration cases (Fig. 2), while it was usually asso-
ciated with the total obliteration cases (Fig. 3).

**Management**

Fourteen patients in group A were managed conservatively,
whereas 59 patients in group B underwent surgical treat-
ment. In the surgically treated group, unilateral, or in 9 pa-
tients bilateral suboccipital craniectomy, and in 7 patients
a combined supra- and infratentorial approach, had to be
performed. In all cases, prone position was utilized to pre-
vent air embolism from a potentially torn venous sinus.

**Results**

**Clinical presentation**

The time lapse from injury to diagnosis ranged between
1 h and 6 days; 54 of the patients were within the first
24 h (acute cases) and 19 were subacute cases. No chronic
case was encountered. The mean age in the subacute cases
(7.3 years) was strikingly lower than in the acute cases
(17.4 years). It was noticeable that the patients with a sub-
acute form of PFEDH were almost always in the 1st -