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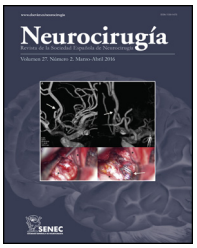

Clinical Research

Trends in computed tomography characteristics, intracranial pressure monitoring and surgical management in severe traumatic brain injury: Analysis of a data base of the past 25 years in a neurosurgery department☆

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ABSTRACT

Objective: To describe the radiological characteristics, surgical indications, procedures, and intracranial pressure monitoring of a representative cohort of severe traumatic brain injury (sTBI) cases collected over the past 25 years, and to analyse the changes that have occurred by dividing the period into 3 equal time periods.

Methods: An observational cohort study was conducted on consecutive adult patients (>14 years of age) with severe closed TBI (Glasgow Coma Scale score [GCS] ≤ 8) who were admitted during the first 48 h after injury to the Hospital 12 de Octubre from 1987 to 2012. The most relevant radiological findings, surgical procedures, and intracranial monitoring indications reported in the literature were defined and compared in 3 equal time periods (1987–1995, 1996–2004, and 2005–2014).

Results: A significant increase was observed in subdural haematomas with lesions over 25 cc, and midline shift in the last period of time. The incidence of subarachnoid haemorrhage increased significantly with time. There was a progression to a worse computed tomography (CT) classification from the initial CT scan in 33% of cases.

Surgery was performed on 721 (39.4%) patients. Early surgery (<12 h) was performed on 585 (81.1%) patients, with the most frequent being for extra-cerebral mass lesions (subdural and epidural haematomas), whereas delayed surgery (>12 h) was most frequently performed

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due to an intracerebral haematoma. Surgical treatment, both early and late was significantly lower with respect to the first time period. Decompressive craniectomy with evacuation of the mass lesion was the preferred procedure in the last time period.

Intracranial pressure monitoring (ICP) was carried out on 1049 (57.3%) patients, with a significantly higher frequency in the second period of time. There was adherence to Guidelines in 64.4% of cases. Elevated/uncontrolled ICP was more significant in the first time period.

Conclusions: As a result of the epidemiological changes seen in traumatic brain injury, a different pattern of morphological injury is described, as depicted in the CT, leading to a difference in practice during this period of observation.

Evolución temporal en las características de la tomografía computarizada, presión intracraneal y tratamiento quirúrgico en el traumatismo craneal grave: análisis de la base de datos de los últimos 25 años en un servicio de neurocirugía

Palabras clave:
Trauma craneal grave
Tomografía computarizada
Craneotomía
Craniectomía descompresiva
Presión intracraneal
Guías clínicas

RESUMEN

Objetivo: Describir las características radiológicas, quirúrgicas y manejo de la presión intracraneal (PIC) de una cohorte de pacientes con traumatismo craneal grave (TCEG) ingresados en los últimos 25 años.

Métodos: Estudio observacional de una cohorte consecutiva de pacientes adultos (>14 años) con TCEG cerrado (GCS $\leq$ 8) admitidos en las primeras 48 h del TCEG en el Hospital 12 de Octubre entre 1987 y 2012. Se definieron las características radiológicas, los procedimientos quirúrgicos y las indicaciones de monitorización de la PIC y se compararon en los 3 periodos de tiempo (1987-1995, 1996-2004 y 2005-2014).

Resultados: Se apreció un aumento significativo del hematoma subdural mayor de 25 cc, de la desviación de la línea media y de la hemorragia subaracnoidea (HSA) en el último periodo de tiempo.

Fueron intervenidos 721 pacientes (39,4%); 585 (81,1%) en las primeras 12 h (cirugía precoz). El tratamiento quirúrgico disminuyó significativamente en el último periodo de tiempo, siendo la craniectomía descompresiva (CD) con la evacuación de una masa intracraneal el procedimiento más utilizado en el este periodo.

Se monitorizó la PIC en 1.049 pacientes (57,3%), con una frecuencia significativamente mayor en el segundo periodo, con una adherencia a las Guías del 64,4%. La PIC elevada incontrolable fue significativamente mayor en el primer periodo de tiempo.

Conclusiones: Como consecuencia de los cambios epidemiológicos que se han apreciado en los pacientes con TCEG en los últimos 25 años, describimos un patrón diferente de lesión morfológica, como se puede apreciar por el cambio en la TC, lo que determina un cambio en la práctica clínica durante este periodo de observación.

Introduction

The epidemiological and clinical profile of a cohort of 1830 patients with a severe traumatic brain injury (sTBI) at the Hospital 12 de Octubre has been described in a previous publication[1]. In this second part, we describe the trend in the computed tomography (CT) findings, indications for intracranial pressure (ICP) monitoring and surgical treatment over the last 25 years, divided into three established time periods.

The Glasgow Coma Scale (GCS) is now essential for classifying patients with a sTBI, but it has become increasingly unreliable when assessing the severity of the injury, primarily due to the ever-increasing early use of sedation, intubation and ventilation in patients with sTBI.[2] CT scans provide essential diagnostic information about the structural injury caused after a sTBI and the need to perform surgery or ICP monitoring. As a result, they have been gaining greater importance when it comes to the classification and prognosis of these patients.

In 1991, Marshall et al.[3] introduced a CT classification based on the experience of the *Traumatic Coma Data Bank* (TCDB), grouping patients with sTBI according to certain CT characteristics. The purpose of this classification was descriptive,