Chronic Subdural Haematoma: A Retrospective Series of 158 Cases

Javier Alberto Morales Lara, Javier Ros de San Pedro* and Beatriz Cuartero Pérez
Department of Neurosurgery, Virgen de la Arrixaca University Clinical Hospital, Spain

Abstract
Introduction: We present a series of 158 cases of patients admitted to our Neurosurgery ward due to the presence of a Chronic Subdural Haematoma (CSDH) as the main pathology.

Materials and Methods: Clinical histories of 158 patients in a 3-year period were reviewed. The criteria for CSDH diagnosis used were an intracranial/extra-axial accumulation, iso-hypodense relative to brain parenchyma on CT-scan. The variables analyzed were sex, age, pharmacologic and traumatic history, clinical presentation, radiologic findings, type of treatment, corticoids at discharge, and outcome.

Results: Sex distribution showed a 65% male predominance. Mean age was 75 years. Anticoagulants or antiplatelet drugs had been taken by 46% of patients. A previous traumatic event was confirmed in 56% of cases. Cognitive impairment was present in 43%, headache in 35%, and focal neurological deficit in 82%. Side distribution was 45% left, 33% right, 21.5% bilateral y 0.5% interhemispheric. The average width was 19 mm, with a mean midline displacement of 7 mm on CT-scan. Surgical treatment was performed in 85% of patients, consisting in a burr-hole technique in all cases. Recurrence rate was 9%.

Conclusion: The prototypical CSDH patient is an elderly male, with history of traumatic event, and presenting with focal neurological deficit. The burr-hole surgical technique provides radiological resolution of the hematoma and clinical improvement in 90% of cases.

Keywords: Chronic subdural hematoma; Pathology; Parenchyma

Introduction
The Chronic Subdural Hematoma (CSDH) is one of the most frequent neurosurgical pathologies that require surgical treatment. With an annual incidence of 7.35 new cases in the population of 70-79 years of age [1], and the rising of life expectancies in developed countries, it’s becoming more common to admit patients due to this illness. The high prevalence of comorbidities that require anticoagulants and antiplatelet drugs are also factors associated with the presence of CSDH [2], favoring their occurrence and recurrence. Therefore, due to the fragility of this kind of patients, a better understanding of the pathology and evaluation of treatment options are gaining importance to provide the best possible outcome.

The basic physio-pathological principle is the enlargement of the subdural compartment, commonly as a consequence of brain atrophy in the process of aging. The stretching and tearing of cerebral bridging veins can result in bleeding after even minimal trauma. As the hematoma eventually gathers and grows in size, its radiological density diminishes [3]. Other pathologies less frequently associated with CSDH are situations of intracranial hypotension, like Ventriculo-Peritoneal (VP) shunt hyperdrainage or another source of bleeding, such as rupture of arachnoid cysts [4].

The clinical presentation is variable and commonly related to the age of the patient. In the elderly the presence of cognitive impairment or focal neurological deficit are the most frequent onset symptoms. However, headache seems to be the predominant symptom in younger population.

There has been debate for the best treatment option, ranging from conservative medical therapy to surgical procedures with diverse modalities. Corticosteroids are the most widely used drug for medical treatment and in some studies they have demonstrated utility alone and as an adjunct to surgical treatment [5]. New pharmacological treatments include ACE inhibitors and statins with promising results, but more evidence needs to be gathered for sustained recommendation in clinical
Concerning surgical procedures, there has been a lot of debate around which is the most adequate technique, namely, twist drill, burr hole(s), with or without irrigation or post op drains, and craniotomy. All of them have proved good results, but the ultimate technique is yet to be defined [7-12]. The average recurrence rate is 10% to 20% in most series, with apparently no differences between techniques [13,14]. However, some studies have favored the use of drains after finding lower recurrence rates with them.

Materials and Methods

The clinical histories of all CSDH patients (n=158) admitted to our neurosurgical ward in a 3-year period were reviewed. Since our department is a regional service, only patients that could eventually receive surgical treatment are admitted. This fact may have caused a selection bias, meaning that cases with low Karnofsky or Rankin scores, whose radiological findings were not significant or had mild symptoms, could have not been accepted into our ward.

The criterion for CSDH diagnosis used was the presence of an intracranial/extra-axial liquid collection, with iso/hypodense appearance on CT-scan. The variables analyzed were sex, age, pharmacologic and traumatic history, clinical presentation, radiologic findings, type of treatment, corticoids use at discharge, and outcome.

The pharmacologic history in our series included Acenocumarol, Enoxaparin, Acetylsalicylic acid, Clopidogrel and Triflusal. Any traumatic event in the 3 previous months before acceptance, not necessarily head trauma, was considered as likely causative.

For clinical presentation we divided symptoms into 3 categories: Cognitive impairment, headache and focal neurological deficit. Cognitive impairment was considered when family or caretaker referred disorientation, changes of personality or diminished mental functions, or also by confirmation of these symptoms during neurological examination. Focal neurological deficit included: Deterioration in level of consciousness, aphasia or dysphasia, facial or limb palsy, sensitive alterations, and seizures.

The analyzed radiological findings were laterality of hematoma, maximum width of hematoma perpendicular to brain surface, and midline shift.

Treatment options (conservative vs. surgery) were also studied, including the surgical technique performed and the use of corticoids on discharge.

Regarding clinical outcome, a good result was defined as any clinical improvement and the absence of readmissions because of CSDH.

Results

Sex distribution showed a male predominance (65%). Mean age was 75 years. After age stratification, the 71-85 year-old group accounted for 66% of the series (n=105 patients). However, examples of uncommon ages were also encountered. A 7-year-old boy presented with headache and a left VI cranial nerve palsy with ipsilateral CSDH. A 20-year-old male with history of VP shunt presented with headache and left CSDH. Finally, a 35-year-old female that had received epidural anesthesia days before, presented with headache and a bilateral CSDH. All of these young patients received conservative treatment and corticoids, resulting in clinical improvement at discharge (Figure 1 and 2).

Sixty-nine patients (44%) had history of prescribed anticoagulants or antiplatelet agents. Thirty-six patients (23%) took anticoagulants, being Acenocoumarol the most prescribed one (n=31). Thirty-three patients (21%) took antiplatelet agents, with ASA (Aspirin) as the most frequent (n=22). Just 3 patients took ASA+Clopidogrel.

Eighty-nine patients (56%) had history of traumatic event.

Regarding clinical presentation, 130 patients (82%) presented with focal neurological deficits, 68 (43%) did with cognitive impairment, and 56 (35%) with headache, which was present in 54% of patients younger than 70 years (Figure 3 and 4).
The radiological analysis showed that 71 cases (45%) were left sided, 52 (33%) right, 34 (22%) bilateral and 1 (<1%) bilateral (Figure 5). The mean hematoma width was 19 mm, while the mean midline shift was 7 mm.

In the matter of management, 135 patients (85%) received surgery, while 23 (12%) had conservative treatment. In all cases, the surgical technique used consisted in single/multiple burr-hole/s plus post op subdural drainage for at least 24 hrs. The most frequent anatomical sites for burr-hole placement were as follows: 34 parietal (25%), 30 frontal (22%), 22 bilateral (16%), 5 (4%) two burr holes, and 4 (3%) in other sites; 40 cases (30%) were not specified (Figure 6).

In the conservative treatment group, corticoids were prescribed in 20 (87%) cases, Dexamethasone being chosen in 18 (90%) occasions. One hundred and forty three (90%) cases had favorable outcome, with improvement of clinical symptoms. Among the non-favorable outcome group, 14 (9%) patients had CSDH recurrence, while there was only 1 death (<1%). From the recurrent cases, 13 (93%) were treated surgically, composed of 11 (85%) reoperations and 2 first time surgery (15%), which were initially treated conservatively.

Discussion

Previous studies have analyzed separate aspects of the CSDH (epidemiology, physiopathology, risk factors, diagnosis, management, modalities of surgical treatment and outcome), but very few have taken into account this pathology as a whole.

We wanted to present a complete description of the disease from a typical population with no acceptance restriction in a tertiary hospital, including the clinical presentation, radiological findings, treatment, surgical technique when used and outcome. After close analysis of our results, many of our observations concurred with the existing knowledge.

CSDH is an illness of the elderly, favored by the comorbidities that come with aging and drug poly-therapy, of which many are blood-thinners that contribute to intracranial bleeding and may perpetuate the condition. It is of prime importance to keep in mind the common unsteady gait among elderly population that makes them prone to falls, which are frequently found as a triggering factor for CSDH.

There might be a delay for seeking medical attention, influenced because many times the triggering situation (e.g.: Mild head trauma) is not severe enough to justify medical consultation. In contrast, during the interrogation to the family or caretaker, they just may refer that the patient was somehow “different”, even though they do not commonly link the triggering factor to the clinical situation of the patient. Most of the times, the patient is taken to the emergency room only when clinical worsening has ensued, commonly mental deterioration of motor deficit. In younger patients, the presence of persistent headache and short-lasting symptoms motivate a medical consultation. In all young cases an underlying condition was found. It is also notable the high prevalence of headache as main symptom in younger patients, which is opposite to the elderly. This finding is relatable to increasing brain atrophy with age.

It was curious that our CSDH series showed a left-sided predominance. Larger series also presented this finding and tried unsuccessfully to find an explanation to this phenomenon.

Both, conservative and surgical treatments have proved to be good options. Conservative treatment is considered of choice in cases with mild symptoms, when the hematoma dimensions do not meet surgical criteria (>10 mm width or >5 mm midline shift on CT-scan) or the overall clinical situation of the patient makes surgery a high risk procedure [15-21]. Corticoids seem to have benefit as pharmacological treatment, and if doses, duration of treatment and adequate patient selection is made, the secondary or adverse effects can be well tolerated.

The election for surgical technique is influenced many times by the surgeon’s experience and/or preferences. We usually perform burr-holes and drainage placement for at least 24 hrs. We favor this technique because it is fast and simple; it can be performed under local anesthesia, and has provided good results. Our recurrence rate
is in accordance with those observed in other series. This might be biased because some patients can receive treatment in local hospitals and not be transferred to our unit.

Conclusion

The prototypical CSDH patient is an elderly male, with prior history of a mild traumatic event, who presents with focal neurological deficit and/or mental impairment. CSDH are commonly left-sided, have a mean 19 mm width and cause an average 7 mm midline shift on CT-scan. Surgical treatment, consisting in single/multiple burr-holes plus subdural drainage for 24 hours has provided magnificent results, with clinical improvement in 90% of cases.

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References