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Thrombosis of the Transverse Sinus: About a Clinical Observation and Review of the Literature

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Abstract

Cerebral venous thrombosis has an unfavorable prognosis. It is a rather rare pathology concerning 3 to 5 cases per million inhabitants. The clinical symptomatology also varies according to the topography of the venous thrombosis and, in some cases, the CVT can have an unusual presentation. Progress and accessibility of non-invasive imaging currently allow early diagnosis of CVT. Brain MRI is the reference method for the diagnosis of CVT. We report a case of transverse sinus thrombosis in a 32-year-old male patient who consulted for headaches through which we want to study the etiological, clinical, paraclinical, therapeutic aspects as well as the evolutionary profile. The clinical history dates back to 2 weeks ago with frontal headaches radiating to the occipital region, throbbing of severe intensity, progressive onset and permanent evolution associated with right unilateral anterior purulent rhinorrhea. He had no nasal obstruction, epistaxis, hearing loss or other otological symptoms; no neurological deficit or notion of head trauma. Cerebral and maxillofacial computed tomography showed right maxillary sinusitis and right transverse sinus thrombosis. We carried out medical treatment based on antibiotics and analgesics without the use of anticoagulants. The evolution was favorable after four weeks of treatment. Conclusion: Transverse sinus thrombosis has a non-specific and heterogeneous clinical presentation. Headaches are the first sign. MRI and CT can help establish the diagnosis. The treatment is both etiological and symptomatic.

Keywords

Transverse Sinus Thrombosis, Headache, Non-Surgical Treatment

1. Introduction

For a long time, cerebral venous thrombosis (CVT) was considered a rare condition with an unfavorable prognosis [1]. It is a rather rare pathology involving 3 to 5 cases per million inhabitants, or approximately 0.5% of all strokes [2]. It is characterized by the extreme diversity of their clinical presentation and their etiologies as well as the unpredictability of the prognosis [3]. The etiologies are often of multiple associated causes [1]. Local: head trauma, tumours, arteriovenous malformations, venous developmental abnormality, neighborhood infections (ENT: sphenoid and petrous bone) or systemic. General diseases: systemic lupus erythematosus, thrombophilias, congenital diseases, coagulopathies, neoplasias, hemopathies, iron deficiency, and drugs. We report an exceptional clinical case due to the evolutionary profile, the incriminated etiology.

2. Observation

This is a 32-year-old male SD who consulted the ENT department for headaches with dizziness. The clinical history dates back to 2 weeks ago with frontal headaches radiating to the occipital region, throbbing of severe intensity, progressive onset and permanent evolution associated with right unilateral anterior purulent rhinorrhea. He had no nasal obstruction, epistaxis, hearing loss or other otological symptoms; no neurological deficit or concept of cranial traumatism no known particular medical antecedents, TA 11/08 cm hg, temperature at 37˚C. Cerebral and maxillofacial computed tomography showed thrombosis of the right transverse sinus (**Figure 1**) and right maxillary sinusitis (**Figure 2**). We hospitalized the patient for a period of 10 days in the department where he was under treatment and monitoring our therapeutic protocol during hospitalization was as follows C3G 2 g per day to be divided into two doses morning and evening for 10 days, metronidazole infusion twice a day for 5 days, Paracetamol infusion 1 g plus 1 Acupan ampoule infusion every 8 hours for 5 days. After the hospital stay, we resumed the oral route with Cefpodoxine proxétil 200 mg taken twice a day, over a period of 6 weeks. This treatment was associated with a nasal wash with saline and short-term corticosteroid therapy based on Deflazacort 30 mg two tablets taken as a single dose in the mornings for 5 days. Monitoring items included consciousness, neurological status, temperature, blood pressure, progression of headaches, and dizziness.

The evolution was favorable with disappearance of the headaches and dizziness after 3 weeks of treatment, but we had a complete remission of the paraclinical signs after 8 weeks of treatment. The prognosis was favorable in our case under treatment by remission and without worsening of the clinical signs and

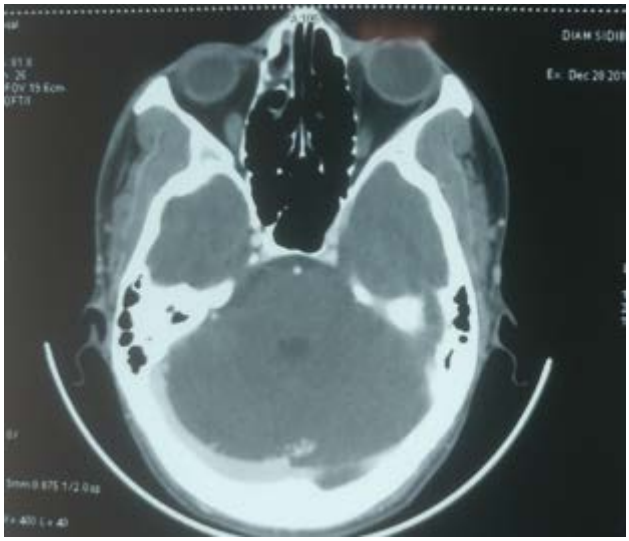

Figure 1. Cerebral CT and maxillofacial axial section visualizing right transverse sinus thrombosis "Rope sign".

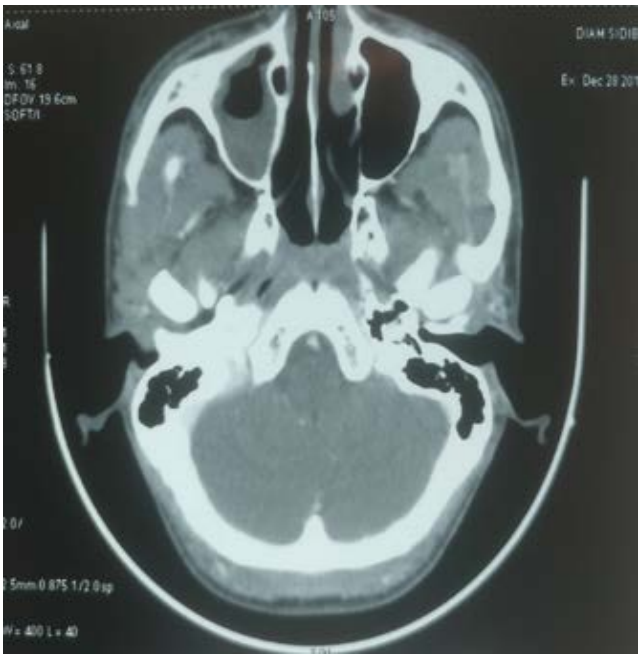

Figure 2. Axial CT scan showing sinusitis right maxilla.

imaging which disappeared after a control CT (**Figure 3**).

3. Discussion

The incidence of cerebral venous sinus thrombosis is approximately 0.05% - 1.5%. In general, the distinction is made between thrombosis of the venous sinuses of septic origin and those of aseptic origin, less than 10% of all cases having an infectious cause [4].

Clinically, in accordance with the literature, headaches are the main warning signs in 90% of cases [3] [5]. The frequency of other symptoms varies between

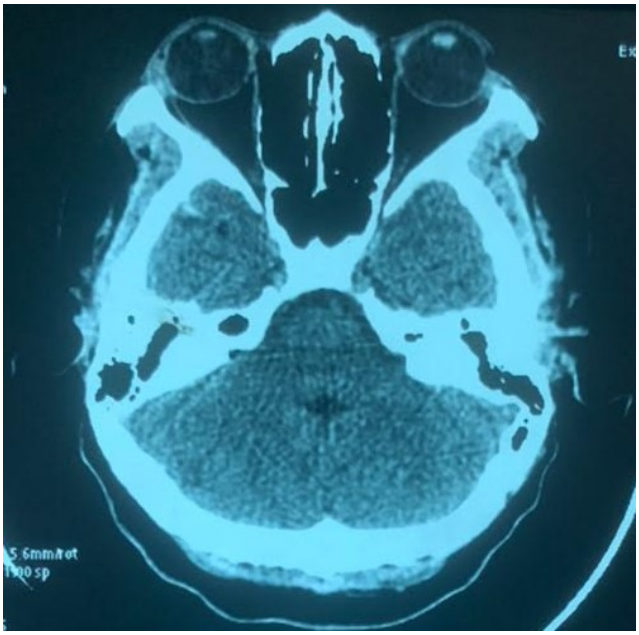

Figure 3. Cerebral CT, axial section of control 2 months after treatment.

series. There are signs of intracranial hypertension, motor or sensory deficits, most often unilateral and predominant in the lower limbs, convulsive seizures, consciousness disorders, language disorders, nerve damage [6]. Some authors have reported notions of impaired consciousness, neurological deficit and vertigo in 71%, 13% and 25% respectively [4] [5]. In our case, apart from vertigo, none of his symptoms were associated. In the literature about 13% of patients have an unfavorable prognosis ("modified row in scale" ≥ 3 after six months). Poor prognostic factors include advanced age, male gender, stasis hemorrhage, thrombosis of internal cerebral veins and right transverse sinus, central nervous system infections and neoplasias [4].

Imaging, in particular cerebral CT, but especially MRI, allows the diagnosis. Cerebral CT with and without injection is the first examination to perform when cerebral venous thrombosis (CVT) is suspected. Although it does not always provide proof of thrombosis, it remains the most usual screening examination, and initially makes it possible to eliminate the many other conditions such as tumours, abscesses or encephalitis that can give the same clinical symptomatology. The abnormalities observed are classified into direct signs and indirect signs [6] [7].

The direct sign in CT without injection corresponds to spontaneous hyperdensity of the thrombosis, it is reported under the name of "cord sign". In our case, the direct sign was observed on CT (**Figure 1**).

The indirect signs of CT are venous ischemia which represents the most specific indirect sign of cerebral venous thrombosis. We can also find abnormal contrast uptake in the tentorium of the cerebellum and the falx cerebri [6].

Cerebral MRI is very effective for the diagnosis of CVT because it visualizes both thrombosis, its development, any associated parenchymal lesions and

sometimes the underlying cause. It is often supplemented by magnetic resonance angiography (MRA) showing the absence of visualization of the thrombosed sinus on the three-dimensional reconstruction image [6] [8]. In our case, we did not use MRI since it is not available in our country.

Etiologically: Locoregional infections, especially ENT infections, have been widely cited as etiological factors. These include sinusitis, cellulitis, otitis and mastoiditis. The most incriminated sinusitis remains sphenoids with regard to their direct anatomical relationship with the base of the skull [5] [8]. Sinusitis thus represented approximately 29% of the causes in the series of Fallou Galass NIANG [9]. In our case, the only incriminated etiological factor was ipsilateral maxillary sinusitis. However, the causes of cerebral venous thrombosis are very numerous and varied, including prothrombotic factors (protein C or S deficiency), prothrombotic conditions such as pregnancy and peripartum, cancer, infection or dehydration, or even certain medications [10].

On the therapeutic level: The treatment is based on 3 main axes: symptomatic treatment, anti-thrombotic treatment and etiological treatment.

Symptomatic treatment depends on the symptoms present. Patients with acute symptomatic seizures should be treated with antiepileptic drugs to prevent recurrent seizures [11]. We did not use it in our case. In the treatment of intracranial hypertension (HTIC), corticosteroids have been used for a very long time, but acetazolamide or fluid restriction are currently preferred. In the forms with isolated HTIC, CSF evacuation before heparinization, associated with acetazolamide, usually leads to sufficient control of visual function. If visual acuity continues to deteriorate or if alertness disorders set in, mannitol can be added [6]. In our work, the symptomatic treatment was based on level 2 analgesics and short-dose corticosteroids.

Etiological treatment depends on the suspected etiology. In septic forms, antibiotic therapy is adapted to the portal of entry and is sometimes associated with surgical treatment [6] [12]. In our case, the infectious origin was suspected. The patient was therefore put on a C3G and metronidazole combination IV for 10 days and the relay orally for approximately 3 weeks. This allowed a complete remission of clinical and paraclinical signs in our patient.

treatment: The anticoagulant was not used in our patient as in many other series [12] [13]. Its use remains controversial [13]. But in the literature several authors recommend its systematic use [6] [11] [14].

Anti-thrombotic treatment is based on heparin. The meta-analysis of available studies shows a 15% reduction in mortality [6]. There is no consensus on the modality, type (unfractionated heparin or low molecular weight heparin) or duration of heparin therapy. Conventionally, heparin is administered at a hypocoagulant dose until the patient is clinically stabilized. A relay is then carried out by anti-vitamin K (AVK) with the objective of an INR (International Normalized Ratio) between 2 and 3. The duration of administration depends on the underlying cause. It is usually 6 months to 1 year, in the absence of causes requiring prolonged treatment such as antiphospholipid syndrome or Bechet's

disease [6].

The evolution was favorable in our case after 4 weeks of treatment with complete remission of symptoms. In the literature CTVs currently have very low mortality. The rare deaths in the very early phase are mainly due to cerebral involvement secondary to parenchymal lesions or severe and diffuse cerebral vasogenic edema. However, even if mortality has decreased in recent years, the death rate reported in the literature is 5% to 10% [6] [11].

4. Conclusion

Transverse sinus thrombosis has a nonspecific and heterogeneous clinical presentation. Headaches are the first sign. MRI and CT can help establish the diagnosis. From many and varied causes. Therapeutic management is based on etiological and symptomatic treatment. The use of heparin therapy, AVK is more and more systematic. The evolution is generally favorable.

Author Contributions

All the authors contributed to the realization of this work. All read and approved the final version of the manuscript.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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