

Case Report

Lateral Sinus Thrombosis in a Children

Nagnouma Camara^{1,*}, Kon éFatogoma Issa² , H é ène Samak é¹, Ngni ée Tafo Neuilly², Tarata Alima¹, Dicko Ibrahim², Ganaba Abdoulaye Modibo², Tour éTata², Nouhoum Traor é³, Barry Sadou², Konat éDrissa², Konat éOumar², Samak éDjibril³, Bakayoko Drissa Kaloga⁴, Mariam Sangar é⁵, Ko ïa Mamadou¹, Samba Karim Timbo², Keita Mohamed Amadou²

¹Commune III Reference Health Center, Bamako, Mali

²Gabriel Tour éUniversity Hospital Center, Bamako, Mali

³Reference Health Center of Commune IV, Bamako, Mali

⁴Luxembourg Mother and Child University Hospital Center, Bamako, Mali

⁵Commune Reference Health Center II, Bamako, Mali

Abstract

Objective: Describe the clinical and therapeutic aspects of septic lateral sinus thrombosis through a case in children. **Clinical case:** O.C 15 years old, male, shepherd, with history of CME of around 5 years, received urgently for headache, dizziness, vomiting and a notion of fever with purulent and fetid otorrhea on the left associated with otalgia and hypoacusis. Our physical examination found a fever of 39.5 °C; neck tightness with pain along the left sternocleidomastoid muscle. Otoscopic examination revealed purulent and fetid otorrhea on the left with a scaly deposit. After aspiration we visualized a subtotal and marginal tympanic perforation with a moist base. The right ear is unremarkable. CT scan showed the Delta sign [Figure 1] as well as associated thromboses of the internal jugular vein [Figure 3] and the transverse sinus [Figure 2]. The treatment consisted of a left masto-atticotomy [Figure 4] with skeletonization of the lateral sinus as well as filling with abdominal fat, a cartilaginous tympanoplasty and 2 months of antibiotic therapy. We did not use anticoagulants. The evolution was marked by the regression of local and general signs without complications or after-effects. **Conclusion:** lateral sinus thrombosis is a serious complication of otitis media, especially in children, but rare. Its diagnosis is often delayed, hence the importance of emergency imaging in the face of suggestive signs. Early treatment is a prognostic guarantee to reduce morbidity and mortality.

Keywords

Lateral Sinus ,Thrombosis, Children, Computed Tomography, Skeletonization

*Corresponding author: cnagnouma7@gmail.com (Nagnouma Camara)

Received: 2 December 2024; **Accepted:** 17 December 2024; **Published:** 23 September 2025



Copyright: © The Author(s), 2024. Published by Science Publishing Group. This is an **Open Access** article, distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

1. Introduction

Septic lateral sinus thrombosis is a rare but serious complication of middle ear infections [1]. Before the advent of antibiotic therapy, it was classified as the 2nd most common complication after meningitis. Currently its mortality rate is between 5% and 10% [2, 3]. In children, its incidence varies between 0.4 and 0.7 per 100,000/year [1]. It represents 2-20% of all intracranial complications. The high frequency of these complications in children is explained by the anatomical proximity and permeability of the bone sutures [3, 4]. The infection spreads near the middle ear to the perisinus area causing a perisinus abscess which then spreads to the dura mater and the intimal layer of the sinuses causing a mural thrombus. In the absence of appropriate antibiotic therapy, the mural thrombus develops and necrosis forming an intramural abscess. Within the lumen of the sinus, the mural thrombus spreads proximally to other cerebral venous sinuses and extends caudally to the internal jugular and subclavian veins. Embolization of infected thrombus that spreads into the systemic circulation causes sepsis. As a result, TSL is frequently associated with other complications [2, 5]. Septic thrombosis of the lateral sinus of otogenic origin is polymorphic; it is asymptomatic or manifests itself by non-specific signs (headache, fever). Magnetic resonance imaging and computed tomography play an essential role in the diagnosis of TSL. This diagnosis can be made intraoperatively during a mastoidectomy [5]. Unsuitable antibiotic therapy masks the typical form [2]. It should be mentioned in the face of persistent and intractable headaches and in the presence of cervical pain or swelling at the anterior edge of the sternocleidomastoid in the absence of lymphadenopathy. Subsequently, hydrocephalus appears with papilledema at the fundus [5]. The aim of this work is to describe the clinical aspects as well as the therapeutic modalities of septic thrombosis of the lateral sinus through a case in children.

Goals:

We report a case of septic thrombosis of the lateral sinus of otogenic origin in a 15-year-old child. We describe the clinical and radiological aspects as well as the therapeutic and progressive modalities.

2. Clinical Observation

This is the child O.C aged 15, shepherd, received urgently for headaches, dizziness, vomiting, a notion of fever associated with ear pain and hypoacusia evolving for 7 days. There is purulent and fetid otorrhea on the left side which has been developing intermittently for approximately 5 years. Our physical examination found a fever of 39.5 °C, a deterioration in general condition with signs of dehydration and malnutrition, neck tightness with pain along the left sternocleidomastoid muscle. On otoscopic examination we revealed purulent and fetid otorrhea on the left with a scaly deposit. After aspiration we visualized a subtotal and marginal tym-

panic perforation with a moist base. The right ear is unremarkable. Biology found microcytic anemia 9.5 g/dl, leukocytosis with polynuclear neutrophils, a thick drop positive at 1000 trophozoites/ml. After emergency hospitalization in the pediatric department of the Reference Health Center of commune III, we initiated parenteral treatment based on: Rehydration, dual antibiotic therapy (amoxicillin 80-100 mg/kg/day and metronidazole 30 mg/day). kg/d), a whole blood transfusion (2 bags) antimalarial. The CT scan performed on day 2 of hospitalization showed total filling of the mastoid cells with an absence of contrast enhancement of the left lateral sinus surrounded by contrast enhancement of the surrounding dura mater (Delta sign) [Figure 1] as well as associated thromboses of the internal jugular vein [Figure 3], transverse sinus [Figure 2] and cavernous sinus.



Figure 1. Axial CT brain section (filling of the mastoid cells with absence of contrast enhancement of the thrombosed lateral sinus: Delta sign).

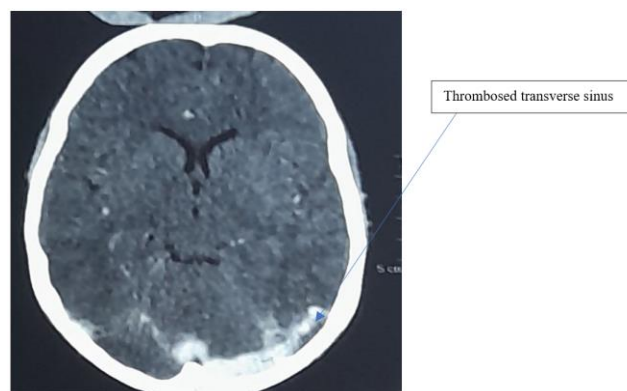


Figure 2. Axial CT brain section: transverse sinus thrombosis.



Figure 3. Frontal cervical CT showing thrombosis of the jugular vein.

The frontal chest x-ray made allowed Lermi ère syndrome to be ruled out. Under general anesthesia with orotracheal intubation, we performed a left masto-atticotomy with skeletonization of the lateral sinus [Figure 4] and filling of the mastoid void with abdominal fat as well as a cartilaginous tympanoplasty. We did not observe any incidents or accidents during or after surgery. Post-operatively, parenteral treatment was continued as follows: amoxicillin 80-100 mg/kg/day and

metronidazole 30 mg/kg/day) for 5 days then antibiotic therapy for 2 months (Amoxi/clavilanic orally). We did not use anticoagulants. The evolution was marked by the regression of local and general signs with a follow-up of three months without complications or after-effects.

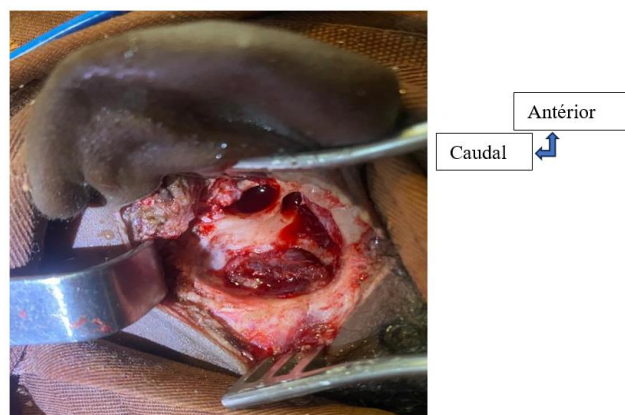


Figure 4. Surgical field: skeletonization of the thrombosed lateral sinus (Masto-atticotomy G with skeletonization of the lateral sinus, Cartilaginous tympanoplasty, Filling with abdominal fat).

Table 1. Clinical manifestations and treatment.

Author/year	Clinique	Paraclinique	Traitement	Evolution
FI kon é/2013	-Temporal headache with cervical irradiation		-Hospitalization/ Resuscitation	
	-Foul otorrhea, EAC polyp, subtotal marginal tympanic perforation	Anemia 5.1 g/dl	-Tri-Antibiotherapy (cef, metro, cipro)	-No recurrence in 6 months of control
	-Seizure	Hyperleukocytosis		
	-Alteration of consciousness	High CRP 10 mg/l	-Atticomastoidectomy, posterosuperior tympanotomy without action on the thrombosed sinus	-No after-effects
Baddouh/2019	-Meningeal syndrome	CT: delta sign		
	-Convulsive seizures	HTIC signs -CT: Delta sign, parenchymal lesion (hemorrhagic softening)	- Antibiotics	Aftereffects (optic atrophy, paralysis of the VI, epilepsy)
	-Diffuse and/or focal neurological signs	-MRI if possible	-Anticoagulant Mastoidectomy without skeletonization	-Death
Boumedil/2020		HTIC signs	Hospitalization	
		-Lethargy	-Anticoagulant	
	-Acute febrile convulsion	-Behavioral disorder	-Antiepileptic	Sequelae (optic atrophy, epilepsy)
	-Convulsive status epilepticus	-Anemia	-Antibiotics	
		-Thrombocytosis	Mastoidectomy	-CIVD
		CT/MRI/	-Sequelae (optic atrophy, epilepsy)	-Death
		CT angiography: thalamic parenchymal lesions, delta sign	-CIVD	
			-Death	

Author/year	Clinique	Paraclinique	Traitement	Evolution
Meherzi/2022	-Headache, fever, ear pain -Eye signs Otorrhea, perforated ear-drum	-Anémie Hyperleucocytose CT/MRI: Delta sign	Antibiotherapy Anticoagulant Antro-mastoidectomy with skeletonization	No after-effects, No recurrence

3. Discussions

Lateral sinus thrombosis is a rare and serious pathology, especially in children. This rarity has been widely found: in Baddouh et al. who identified 12 cases in 10 years in Morocco [1] as well as Boumendil et al. who identified 10 cases in Algeria from 2008 to 2018 [6]. Rajak et al. recorded 15 cases in 5 years [2] and others 10 cases in 25 years [3]. Male predominance has also been widely described in the literature. This could be explained by the higher frequency of ear infections in boys compared to girls. Clinical polymorphism has been described by several authors. Our symptomatology has been described in the literature [5]. Convulsions, headaches and disturbances of consciousness represent the most frequently reported signs in studies [1]. Venous thrombosis in children is a multifactorial condition, with multiple etiologies. The general causes are dominated by infections, dehydration, anemia, alongside chronic pathologies predisposing to cerebral venous thrombosis such as nephrotic syndrome, congenital heart disease and systemic lupus erythematosus [1-3]. Our patient was dehydrated, anemic at 9.5 g/dl with malaria at 1000 trophozoites/ml. Unlike other authors [2, 7] who found cervical swelling, we observed painful cervical swelling along the left ipsilateral sternocleidomastoid muscle. Thrombosis was associated with predisposing factors in all cases in Boudemil et al. [6]. We performed a CT scan of the rocks with and without injection of contrast products which demonstrated the Delta sign which was also found in the study by Rajak et al. [2]. The extension of thrombosis to other sinuses has been widely discussed in the literature. In our case we found associated thromboses of the external jugular vein, transverse sinus and cavernous sinus. According to the literature, venous phase angiography and MRI angiography are much more sensitive examinations [2, 5, 7]. Classically, the CT scan shows a delta image which is an opacity of the lateral venous sinus on the images without injection and an absence of venous opacification accompanied by an enhancement of the contrast of the adjacent dura mater on the images after injection. Indirect signs can also appear such as an increase in the caliber of collateral and contralateral vessels due to changes in blood flow. But we must be wary of the CT scan which can give a false positive [5]. Les siéges de prédilection sont par ordre de fréquence décroissant: le sinus latéral, le sinus longitudinal, le sinus sigmoïde et le sinus sagittal. Des

thromboses multiples et profondes ont également été retrouvées dans la série de Boudemil. Les Causes infectieuses (otite, oto-mastoidite, méningite) représentaient l'étiologie de la thrombose veineuse cérébrale la plus fréquemment retrouvée dans la même série (6 patients) [6]. La prise en charge est médico-chirurgicale (antibiothérapie adaptée et prolongée). Nous avons procédé à une mastoïdectomie avec squelettisation du sinus latéral et comblement du vide mastoïdien par la graisse abdominale ainsi qu'une tympanoplastie cartilagineuse. L'usage des anti-coagulants est de plus en plus controversés lié aux risques d'embolie septique, d'hémorragie voire de CIVD [8]. Rajak et coll. n'ont pas fait usage d'anticoagulant et ont eu un taux de guérison de 100% de leurs patients [2]. Par contre Abir et coll. Ont utilisés les anticoagulants avec succès chez 90% de leurs patients [3]. Malgré qu'il ne soit pas codifié le traitement par anticoagulant a démontré son efficacité dans la réduction de la morbi-mortalité associée aux thromboses veineuses cérébrales chez l'enfant. Plus d'études prospectives randomisées et contrôlées s'avèrent nécessaires pour codifier ce traitement dans la population pédiatrique [1].

4. Conclusion

Septic lateral sinus thrombosis represents one of the most serious endocranial complications of otitis media. The clinical signs are varied and non-specific: headache, earache, recurrent fever, vomiting and neck pain. Magnetic resonance imaging (MRI) and computed tomography (CT) are the examinations of choice to confirm the diagnosis with greater specificity for MRI. The classic CT image is the absence of contrast enhancement of the thrombosed lateral sinus: Delta sign. Management is medical-surgical with appropriate and prolonged antibiotic therapy and mastoidectomy with exposure of the lateral sinus. Anticoagulants are increasingly controversial mainly because of the risk of septic emboli and hemorrhagic accidents.

Abbreviations

CT	Computer Tomography
CIVD	Disseminated Intravascular Coagulation
HTIC	Intracranial Hypertension
MRI	Magnetic Resonance Imaging

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] N Baddouh, S Elbakri, G Draiss, Y Mouaffak, N Rada, S Younous, M Bouskraoui Cerebral venous thrombosis in children: about a series of 12 cases. *PanAfrican Medical Journal*. 2019; 32: 22. <https://doi.org/10.11604/pamj.2019.32.22.17656>
- [2] Raja K, Parida PK, Alexander A, Surianarayanan G. Otogenic lateral sinus Thrombosis: A review of Fifteen patients and changing trends in the management *Int. Arch. Otolaryngol*. 2018; 22 (3): 208-213. <https://doi.org/10.1055/5-003-160196>
- [3] Abir M, Amal G, Mouna B, et al. Clinical characteristics of otogenic cerebral sinovenous thrombosis: Our experience and review of literature. *Clin Case Rep*. 2022; 10: e06475. <https://doi.org/10.1002/ccr3.6475>
- [4] M. Lezreg, M. chenguir, R. Abada, S. Rouadi, M. Mahtar. Lateral sinus thrombosis of otogenic origin in children: report of 3 cases. *French Annal of Otorhinolaryngology and Cericofacial Pathology*. Volume 131, issue, October 201, Page A163. <https://doi.org/10.1016/J.aforl.201.07.388>
- [5] M. François. Complications of acute and chronic otitis media. *EMC Otolaryngology* 2005; 20-135-A-10 [https://doi.org/10.1016/S0246-0351\(05\)27958-8](https://doi.org/10.1016/S0246-0351(05)27958-8)
- [6] Mustafa A, Tiçi B, Taçi H, Gjikoğlu B, Baftiu N. Acute Mastoiditis complicated with concomitant Bezold's Abscess and Lateral Sinus Thrombosis. 2018 Mar 20; 2018: 8702532. <https://doi.org/10.1155/2018/8702532>
- [7] D Boumendil, D Batouche, D Batouche, A Sellam. Cerebral Venous Thrombosis in children: about a series hospitalized in Pediatric Intensive Care. *GSJ* 2020; 8(6): 1492-1510.
- [8] FIKone, SK Timbo, K Singaré S Dao, S Soumaoro, B Guindo, M Keïta, A G Mohamed Thrombophlebitis of the lateral sinus: A lethal pathology. *The African journal of ENT and head and neck surgery* 2013; 13(1, 2, 3): 55-59.